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ABSTRACT

The volume is reported to reflect the broad range of National Institute of Mental Health activities in areas of research, development of mental health manpower, and delivery of mental health services. Twenty papers examine, respectively, relationship of life histories and biochemistry of siblings and twins to schizophrenia, training of Navaho medicine men, development of intelligence in babies, studies of child abuse and infant accidents, community mental health center in Appalachia, educating new leaders via Operation Hope, manner in which social organization of animal communities can lead to a population crisis destroying them, community mental health center in the San Francisco westside, nonprofessionals serving aged public housing tenants, nursery schools in service of mental health, followup survey of long term effects of lysergic acid diethylamide, preschool program for disadvantaged children, infant stimulation as part of well baby care in a disadvantaged area, mental illness and competency to stand trial, studying consciousness with physiological feedback technique, voluntary control of internal states, asymmetry of human brain and implications for training, controlling brain functions, controlling autonomic functions, and drug abuse. (CB)

NATIONAL INSTITUTE OF MENTAL HEALTH

Mental Health Program Reports - 5

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MENTAL HEALTH PROGRAM REPORTS-5

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FOREWORD

This volume, fifth in the NIMH series of *Program Reports*, reflects the broad range of Institute activities in research, the development of mental health manpower, and the delivery of mental health services. Displayed throughout is the Institute's continuing concern with issues of national importance—among them, for example, the well-being of children; the fate of disadvantaged minority group members; the impact of social stress on behavior and health; and the threats posed by such public health problems as drug abuse, aging, and schizophrenia.

The Institute's high priority effort in child mental health is apparent throughout—in reports ranging from a basic study of the child's intellectual development, to a demonstration of how nursery schools can be used as an instrument for mental health. A number of chapters deal in depth with techniques for reversing the behavioral penalties of intellectual and emotional deprivation among youth.

Reflecting another of the Institute's major goals—the provision of high quality mental health services to all segments of the population—are a number of studies describing innovative approaches designed to meet the needs of disadvantaged citizens and members of minority groups. Through a program of infant stimulation and well-baby care, one study shows that marked improvements in intellectual development and verbal ability can be achieved. Another team of investigators has provided dramatic evidence that, properly motivated and placed in a college setting, angry young people in the ghetto demonstrate untapped depths of wisdom and ability. Still another creative project demonstrates how meaningful, effective mental health services can be brought to a population with unique cultural traditions and norms. For Navaho Indians, "the medicine man" is central to the concept of psychic and physical well-being; an Institute training program has capitalized on the perpetuation of this ancient tradition while fostering the health and harmony of the Navaho community.

Throughout this volume the reader will find examples of the Institute's effort to help solve human problems of broad social significance. In one report, for example, the psychological and physiological penalties of overpopulation are dramatically portrayed through the results of a long-term study by a team of Institute scientists. The implication of their data, they warn, are clear: we must choose—and soon—between survival or extinction

through overcrowding our planet. In another chapter, the reader will learn of one of the first efforts to track the long-term effects of LSD, and in still another, of the continuing efforts to uncover the baffling origins of schizophrenia. Reported here, too, are the results of a study addressing one of the most challenging human problems in contemporary American life—how to provide our aged citizens, parents, and grandparents with the sense of dignity, worth, and well-being so easily eroded in the latter years. The delivery of mental health services to the Nation's rural citizens is the focus of an especially detailed chapter while still another deals in some depth with complex issues in the relationship between criminal justice and mental illness.

Finally, a group of reports featured in this volume will introduce to the reader a new field of behavioral research with resounding implications for understanding and treating psychosomatic illness. Known alternatively as "instrumental conditioning" or "biofeedback," this new technique has permitted human beings as well as animals to acquire control over physiological functions such as heart rate and blood pressure that were formerly thought to be involuntary. The results of biofeedback experiments have encouraged clinical studies showing that patients with hypertension, with cardiac arrhythmias, tension headaches, and other ailments have begun to control their own symptoms by "mental" means. As indicated by the projects described here, physiological training may indeed become a new form of treatment and an important technique in the field of preventive medicine.

Taken as a whole, this volume offers a panorama of NIMH efforts. The representative nature of the work reported will indicate not only the direction of new treatment approaches, but the substance of rapidly approaching frontiers in mental health research.

Bertram S. Brown

BERTRAM S. BROWN, M.D.

Director

NATIONAL INSTITUTE OF MENTAL HEALTH

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Schizophrenia: New Light from the Life Histories and Biochemistry of Siblings and Twins

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When one identical twin becomes schizophrenic, but the other does not, what in their environment caused the difference? And when both twins become schizophrenic, what in their biochemical make-up predisposed them to it?

By asking provocative questions like these, Dr. William Pollin and his associates at the Section on Twin and Sibling Studies, Adult Psychiatry Branch of NIMH, hope to uncover major pieces of the jigsaw puzzle that is schizophrenia—a disease which accounts for roughly half of all hospitalized mental patients in the world. They are not primarily interested in twins, but in schizophrenia, and for the past six years they have been conducting a series of strictly controlled studies that combine the techniques of psychiatry, genetics, and biochemistry. These studies focus on: (1) the specific family patterns that contribute to triggering schizophrenia in one twin, but not in another, and (2) the underlying biochemical abnormalities that are shared by both twins. Thus, they point the way to two fruitful lines of attack on this widespread disease.

On the biochemical side, they are currently evaluating the possible significance of their most recent finding on 11 pairs of identical twins: the high rate of catecholamines excreted in the urine of both the schizophrenic and the healthy twin. The catecholamines have two important functions: Some of them, particularly norepi-

nephrine (noradrenaline) carry messages to different parts of the brain; and all of them play an essential role in the body's efforts to cope with stress. For this reason, previous reports of high catecholamines in psychiatric conditions had been attributed to the effects of the patients' anxiety. However, stress usually produces other signs as well—for instance, an elevation of adrenal steroids. Yet the healthy twins showed no parallel rise in their adrenal steroids, indicating that the high rate of catecholamine excretion was not solely a response to stress. And, indeed, other analyses in this Lab determined that the amount of catecholamines in both twins was under genetic control. This strongly suggested that overactivity of the catecholamine system did not merely reflect psychosis, but might help to produce it.

The Sibling Studies: Schizophrenia vs. Delinquency

As Dr. Pollin points out, it is very rare in behavioral research to have really well-controlled comparative studies. This represents a serious problem, particularly since there are so few well-anchored, reliable measures of personality or of psychopathology. Psychiatrists can clinically get the impression that a certain kind of life course is very relevant to a psychosis, but trying to nail down the mechanisms involved is extremely difficult.

He began, therefore, by studying siblings, on the theory that children of the same parents would provide a better basis for comparison. He wanted to compare the circumstances that led a child in each of three sets of families to become either schizophrenic, delinquent, or exceptionally well adjusted, while another child in the same family was just normal. "In some ways, delinquency and schizophrenia are polar opposites," he explains. "Schizophrenia is a disease in which inner representations of the external world become completely distorted, resulting in delusions and hallucinations. Delinquency is a pathology in which one's relations to the outer world are disordered. It is the difference between acting in and acting out." However, nonspecific reactions of guilt and shame are present in the families of both.

The research scheme devised by Dr. Pollin together with Drs. James R. Stabenau and Joe Tupin fitted in with the trend towards focusing not solely on the schizophrenic patient, but on the patient and his family as a unit. It involved three groups of five selected families. The ten youngsters in each group were carefully matched for age (between 14 and 18), sex, sibling order, and social class. All were Protestant. All were being raised by their biological parents. Both parents and both siblings in each family participated in all phases of the research. The five schizophrenics ("S" indexes) had been diagnosed as schizophrenic by at least two

psychiatrists and had suffered from hallucinations, marked paranoid delusions, or marked regression for 6 months to 9 years. The five delinquents ("D" indexes) were referred by legal agencies; they had been charged with car theft, promiscuity, or running away. The exceptionally well-adjusted youngsters ("N" indexes) had been nominated by the staffs of a local junior college and high school for their outstanding academic work and/or personality adjustment and peer relationships. With the exception of the S indexes, all were seen during outpatient visits, and all participants, including the 15 normal control siblings, were interviewed and tested at length.

From the outset, very different patterns emerged among the three sets of families—patterns which appeared to antedate the symptoms of psychological disturbance in S and D families. Among the D families, for instance, all relationships were unstable. There were no fixed roles or responsibilities for anyone, and it was uncertain who would be the father, who the mother, who would dominate or be the leader at any time. By contrast, the S parents seemed locked in a rigid relationship to each other and to their children. It was a kind of stalemate. On the other hand, the N parents seemed flexible, empathic, and able to complement one another. On tests of communication and clear thinking, such as the Object Sorting Test and the Revealed Differences Test, both the S and D families did poorly compared to the N families.

The family histories of the three groups revealed even more striking differences. In nearly every S or D family (but not in the N families), a major crisis, spontaneously characterized by the family as "the worst time," had occurred when the index child was between 6 months and 3 years of age, usually reaching its peak at about the time he was 18 months old. "One of the important consequences of this differing incidence of family crisis appeared to be its potential for serving as the origin of a negative identity in a child through identification with a depressed, guilty, and anxious mother," wrote Drs. Stabenau and Pollin. "In addition, the disruptiveness of the family life at that time further served to reduce the sense of internal security for the index child."

During these earliest years, too, the parents in the S group often viewed the child who later became schizophrenic as either physically or psychologically "damaged." (Few of the non-schizophrenic children were considered defective in this fashion.) And nearly all the children who later became either S or D had younger siblings born within their first two years, while few of the controls did.

But why did schizophrenic symptoms develop in one group, and delinquent symptoms in another, when both suffered from early

family crises? The researchers point to differing family life styles and, in the case of delinquents, to an additional crisis: the sudden collapse of the role of the father, just before the child began to act out. Depending on the timing of this change, one child within the family would become delinquent while the other would not. In one case, for example, a father who had kept his drinking under control slipped over the edge and became an alcoholic. In another, the father developed Parkinsonism. A third father lost his job. The appearance of delinquency nearly always followed a severe loss of self-esteem on the part of the father, usually when the index child was in his teens. The delinquent then seemed to identify with what he saw as an ineffectual, failing father.

Instability of this kind was unknown in the families of the schizophrenics in this sample, where the fathers were employed and generally in good health. Here symptoms often seemed to follow major separations from a parent, close sibling or grandparent. Often the mother scrutinized the index child's activities with phobic concern about where he was and with whom he played, fearing harm at play or his being killed in the streets. This resulted in depriving him of the freedom to explore the world around him—a freedom granted within broad limits to N children, and given almost recklessly to D children. Typically, the index child's life style was, and had been, extremely constricted.

In addition to differences such as these in the patterns of family relationships, existing evidence of a genetic factor in schizophrenia suggests that certain organic factors must have been present in the S families, though not in the others.

An Intensive Study of Identical Twins Discordant for Schizophrenia

As long as the subjects were genetically different, these findings had limited generalizability because inherited traits might account for most of the differences between them. In 1962, Drs. Pollin and Stabenau determined to repeat their study—this time, with identical twins. One-egg twins, they believed, would represent "the optimal controlled sample," in which not only genetic factors but also social, ethnic, chronological and psychological variables were matched to a degree not attainable in other ways.

Twins have been studied with great interest ever since antiquity. The ancients who believed in astrology were intrigued by the fact that twins born at almost the same time could have contrasting life histories. To explain this divergence, they decided that major changes in the configuration of the heavenly bodies must have occurred precisely in the interval between the births of Twin 1 and Twin 2. This meant that if they could locate identical twins with differing life histories and find out the moment of their birth,

they could pinpoint the limits of major astronomical periods. Therefore, they actively sought out and studied such twins. But it was only in the 19th century, with Francis Galton, that the classical twin method came into use as a method of measuring the relative contributions of heredity and environment to a specific illness or other condition.

Since monozygotic (MZ) or identical twins are genetically alike, but dizygotic (DZ) or fraternal twins are genetically no more similar than any other siblings, the degree of concordance between twins of both types is meaningful. If 40 out of 50 pairs of MZ twins are concordant for an illness, but only 10 out of 50 pairs of DZ twins are so concordant, the difference between these two figures is a measure of the genetic contribution to the illness. However, this assumes that the environment of MZ twins could be considered to have been constant—a major flaw in the method, according to Dr. Pollin.

“We set out differently,” he explains. “We did not try to evaluate the relative importance of the genetic factor, but to ignore it, in the sense that it was controlled for both. We were thus in an optimal position to study the non-genetic factors involved.” It took very extensive recruiting through hospitals, university psychiatric departments, and other sources to find enough pairs of identical twins in which one was healthy but the other was adjudged clearly schizophrenic by five psychiatrists, and in which both parents were willing to come to Bethesda to be studied for two or three weeks at the NIH Clinical Center, together with both twins. But finally 16 such families were brought to the Center and evaluated, together with 9 control families.

Having at least these key members of the family present is “almost essential if one hopes to obtain a meaningful historical reconstruction concerning the differential experiences of the two twins,” declare the researchers. “Much of the more important data concerns the mother’s pregnancy and the birth and first years of life of the twins, facts known only to the parents. In the absence of prolonged psychoanalytic relationship with the parents, such material appears to be most accessible via a family-focused evaluation situation in which four family members are constantly supplementing, stimulating, and correcting the material that each recollects and presents.” Besides, they could be given complete psychiatric, psychological, and biological work-ups, including tests of blood, urine, and chromosomes and some 25 different psychological tests. The twins’ zygosity was determined by investigating 28 blood-group factors, as well as fingerprints and 10 anatomical features. Over 30 different collaborating investigators participated in the study.

The schizophrenic twin was admitted to an inpatient ward. If actively psychotic at the time of the study, in most cases he received lengthy treatment at the Clinical Center at no cost to the family. The other members of his family stayed in a physically identical ward on another floor. The nonschizophrenic twin was often interested in being evaluated because he wanted to find out his chances of remaining healthy.

Ever since Dr. Franz Kallmann described his genetic theory of schizophrenia in the 1940's and stated that the concordance rate for schizophrenia was approximately 80 percent—that if one identical twin became schizophrenic, his co-twin was likely to develop the same symptoms in 80 percent of the cases—these figures have stuck in the public mind, producing great fear among affected families. However in 1963, after a careful study of 16 pairs of MZ twins in which one was schizophrenic, the Finnish investigator Pekka Tienari reported that none of the co-twins was affected. Previous studies had traced twins through mental hospitals; Tienari started out with parish records of twin births and followed them up. This may have accounted for some of the difference in results, since the overburdened families of *two* schizophrenic patients would be more likely to have them committed to a mental hospital than the families of one. A larger study by Einar Kringlen in Norway followed up all the twins born in a given area during a given decade and found the concordance rate for MZ twins to be 38 percent, substantially lower than any reported before 1960.

Like the Scandinavian work, Dr. Pollin's current analysis suggests that instead of being concordant for schizophrenia in 80 percent of the cases, MZ twins are actually *discordant* for the illness in approximately 75 percent of cases. Even at the time of his earliest twin studies, he was able to reassure the healthy twins about their prospects, and while all members of the family found the study stressful, in most cases the healthy twins left the Center with their fears lessened.

These figures focused interest, once again, on the psychodynamic factors involved in schizophrenia. Tienari had noted that the twins who were psychologically more submissive were the ones to develop schizophrenia in all but one of his 16 cases. Kallmann and others had made similar observations. The NIMH study of twins essentially confirms this insight, and also explains how and why the environment of the stricken twin differed from that of the healthier twin, almost from the time of conception.

In a detailed report on the first five families studied in 1964, Drs. Pollin, Stabenau, and Tupin described "a consistent pattern

of historical events and related familial attitudes" which distinguished the index from his healthy co-twin:

1) The twin who later became schizophrenic weighed less at birth.

2) He was perceived by his parents, particularly by his mother, as vulnerable, and his survival was thought to be imperiled.

3) He was the focus of more worry, involvement, and attention than his co-twin.

4) He developed somewhat more slowly.

5) He tended to perform less successfully, and to be perceived as the less competent and weaker of the twins.

6) He tended to be the more docile and more compliant of the two, was less independent, and had difficulty in achieving any degree of autonomy and separateness.

7) These relative differences tended to be persistent and unchanging.

This pattern resulted in part from constitutional differences, and in part from "a rigidly 'imprinted' role expectation, initiated at birth, determined by the constitutional differences, and subsequently reinforced by minor differences in development," the authors report. They see it as largely the result of a self-fulfilling prophecy.

In all five instances, the mother had a strong conscious fear of death concerning the index twin and/or herself, immediately after his birth. In two of these cases there was a brief period of legitimate concern about the index twin's survival, as he remained in the hospital for several days after his co-twin was taken home. In another, however, the mother would not accept the pediatrician's assurance that both twins were fine and that the smaller one, because of her size, would necessarily feed more slowly and take less formula—she had a phobic anxiety that the smaller twin would die if she did not feed her as frequently and as much as the other.

These worries led the parents to concentrate their efforts on the smaller twin. In each of the five families, the mother felt that the smaller twin "needed her more." When she fed both twins, she fed the smaller one first. If only one could be breast-fed, it would be the smaller one. In two instances, the mothers reporting pinching and slapping the smaller twin and using cold water on him to keep him awake so he would eat more.

Once established, this pattern persisted as the twins grew up. "The smaller twin would receive extra praise for things taken for granted in the larger one," the researchers report. "He would

receive additional help with schoolwork, and would be less expected to dress himself or take responsibility for personal needs or household chores." The bigger twins were always a bit more successful in school and social life. They played the leader role and made all the decisions. They were also less docile and "good." Only the healthy twins had episodes of active rebellion or acting out. One, for example, engaged in violent controversies with his father, in which the index twin never participated. The index twins never showed non-compliance; if they expressed it at all, it was passively, in such a way that the parents could rationalize it as just another symptom of their disability.

Since the twins appeared identical in so many ways, "the needs of all concerned to find distinguishing identities for them led to a sharpening and highlighting of such initial differences," note Drs. Pollin, Stabenau, and Tupin. They reflect that if the healthy twins had not been present for nearly constant comparison, the parents might not have perceived the index twins as so weak or vulnerable, but might have accepted them as normal. Their anxiety and intense involvement with the smaller twin often led the parents to ambivalent feelings towards him. They tended to project the negative side of their self-image onto this smaller twin more often than on the larger one.

This general pattern tended to hold true as the study progressed. In a report on 11 families with MZ twins discordant for schizophrenia in 1965, the authors declared that each of the 11 index twins was the smaller one at birth. The difference in birth weights ranged from $\frac{1}{2}$ ounce to 1 pound 12 ounces. This lower weight "appears to reflect some lower level of anatomic development and/or differentiation, and consequently, a lesser physiological competence and stability present at birth," they reported. The index twins also had a marked preponderance of such problems as cyanosis, infantile colic, feeding difficulties, burns, multiple fractures, and severe illnesses which knocked them flat for months at a time. Their parents recalled that these smaller twins had "worried more," cried more, been more "fussy," and seemed more sensitive. Almost without exception, and from earliest childhood, the index twins were described as more dependent, more submissive, more fearful, more compliant, and more constricted than their heavier co-twins.

To help refresh their memories, the parents were asked to bring in whatever pictures or home movies they had available. ("It seems all families have large numbers of pictures in shoe boxes," says Dr. Pollin. "They may never have put the pictures into albums, but they have them.") Nevertheless, there remained the problem of retrospective distortion. To alleviate it, a social worker

lived with the families in their homes a couple of days, then went to see as many relatives, doctors, teachers, and friends as possible, accumulating up to 25 interviews per family to get a more objective view of the past. Often she found that many of those who knew the family recalled the bigger twin as an easier child to deal with. Almost from birth, the smaller twin actually had quite a different life course—as he must have had a different, less favorable intrauterine experience.

It is quite normal for one twin to be smaller than the other at birth. Thus, many parents fall into the pattern described above because of realistic concern for a vulnerable child. However, they change this pattern after the child gains in strength and maturity. It is only in certain cases, when parents are too troubled or rigid to modify their picture of the weaker twin, that the pattern becomes potentially dangerous. Apparently something about the weaker twin's situation resonates with a particular problem in these parents' lives, relighting an intense, unresolved conflict. No matter how much the pediatrician may reassure them, they remain consumed with anxiety about the child. On the other hand, they find dealing with the stronger twin an easy task—a distinct relief. In this way the twins experience different models of parental behavior, and have increasingly divergent experiences.

In a later report (1967), Drs. Pollin and Stabenau discuss two additional sets of identical twins in which, surprisingly, the twin who became schizophrenic did not weigh less at birth. They find it very significant that, despite a favorable start, these children suffered from specific stresses which reversed their relative position and, in effect, made them weaker than the lighter twin. In one of these cases, the index twin had turned blue from cyanosis because of poisoning from a defective heater next to her bed and had been taken to a hospital, near death, while her co-twin, who slept in another part of the room, suffered only minor effects. In the other, the twin who was heavier at birth nearly died from a severe case of Rocky Mountain spotted fever at age 3½, after which there was great concern regarding his health and survival.

Thus, whether it began before birth—through differences in fetal positioning and consequent crowding, differences in fetal circulation, or other factors that produced relative physiological incompetence—or through accident in early childhood, life presented very different experiences to these “identical” twins. Between the ages of 2 and 6, the stronger twin was usually the more verbal and the more independent. From 6 to adolescence, the weaker twin often became increasingly dependent on his healthier co-twin—who simultaneously began to turn to others for friendship. In late adolescence and early adulthood, the healthy twin moved further

towards individuality and heterosexual relationships. This accentuated a sense of loneliness and despair in the weaker twin.

"Often, disorganization, withdrawal, and schizophrenic symptomatology develop in the lighter birth weight twin at just this time, i.e., when the heavier, more differentiated twin is making a sudden spurt in the development of an individual identity and the establishment of heterosexual and genital level of personality organization," write Stabenau and Pollin. To the index twin, the world had always appeared more threatening—and its stresses mounted all around him as he grew up.

The Veterans' Study: 15,000 Pairs of Twins Discordant for Schizophrenia

In 1967, the Medical Follow-Up Agency of the National Academy of Sciences-National Research Council made available to researchers its national registry of all the pairs of white male twins born between 1917 and 1927 who served in the Armed Forces during World War II or the Korean War. It was a list drawn from the 54,000 pairs of twins born during that decade. It excluded 23,000 pairs of twins who did not serve in the Armed Forces at all, as well as 15,000 pairs in which only one twin served. This left 15,930 pairs of twins healthy enough for both to have passed the physical and mental tests leading to induction into the service.

The records of these men yielded a wealth of information that could be fed into computer tape: induction physical examinations; inpatient and outpatient hospital and clinic diagnoses during their period of services; VA hospital diagnoses after they left the service; and diagnoses based on responses to a questionnaire. They were between 38 and 48 years old in 1965, after a follow-up period averaging 18 to 20 years.

Among these 15,930 pairs of twins, Drs. Pollin, Martin G. Allen, Axel Hoffer, and their associates found 338 pairs in which one or both twins had been diagnosed as schizophrenic at some time after entry to active duty. In some cases their zygosity was unknown, but 226 pairs could be identified as identical (MZ) or fraternal (DZ) twins. Among the 80 MZ pairs, 11, or 13.8 percent, were concordant for schizophrenia. Among the 146 DZ pairs, only 6, or 4.1 percent, were concordant for the disease. The concordance rate for schizophrenia was thus 3.3 times greater among MZ pairs than among DZ pairs. By contrast, the concordance rate for neurosis was almost the same in both kinds of twins—10.7 percent for MZ pairs as compared to 7.1 percent for DZ pairs.

A re-analysis of 18 earlier major twin studies showed a similar ratio in all but one instance, suggesting "the presence of a genetic factor in the pathogenesis of schizophrenia, and its relative ab-

sence in psychoneurosis," report the researchers. "However, since approximately 85 percent of affected MZ pairs in the NRC sample are discordant for schizophrenia, the role of the suggested genetic factor appears to be a limited one."

This large sample of twins also allowed Drs. Allen and Pollin, to their own surprise, to cast doubt on one of the most widely accepted notions of the psychodynamic determinants of schizophrenia in analytic theory: the "diffuse ego boundary" hypothesis. This holds that schizophrenia is due to a "confusion of identity" resulting from weak ego boundaries, and that such problems are greater in twins, especially MZ twins. Therefore, MZ twins could be expected to have a higher incidence of schizophrenia than DZ twins, and all twins would be expected to have a higher incidence of it than the general population. However, neither proved to be the case. The incidence of schizophrenia in the total sample of 31,818 male veteran twins was only 1.14 percent, close to the proportion in the general population. And the incidence of the disease among MZ twins was only .97 percent, compared to 1.22 percent in DZ twins. The authors point out that though these figures do not support the "diffuse ego boundary" hypothesis, they do not actually refute it, either, since possibly other factors unique to twin personality development might offset whatever ego boundary defects exist.

The Transmission of Schizophrenia

"It is very easy, in work with family dynamics, to say, Aha, *this* is the difference in the behavior of the mother and father that leads to schizophrenia—*these* are the schizophrenia-producing characteristics of parents. However, that is not the way we think of it right now," warns Dr. Pollin. Parental factors are only one among a variety of etiologic factors that may play a role in lowering resistance to the disease or triggering it, he explains.

For years there has been an ideological struggle between psychiatrists who believe that schizophrenia results from some genetic, biochemical impairment, and those who believe it comes from faulty child-rearing. Dr. Pollin sees a great need to integrate both points of view.

So far there is no definitive evidence that parental behavior is the predominant factor, he points out. Whether or not it is a necessary factor cannot be determined until enough prospective studies have been completed. Much of the disturbance seen in the parents of schizophrenics may be secondary to the disease, rather than a cause of it. All that can be said with assurance so far is that certain family patterns seem to accompany schizophrenia. However, these patterns cannot be blamed for the disease. It may

be that there was some defect in the child from the beginning—a defect we do not yet know how to recognize or define.

Nor are the patterns of family interaction that Dr. Pollin described the only possible ones in the development of schizophrenia. They may represent only one of several different patterns leading to the same effect. By choosing to work only with families in which both parents and both twins were willing and able to come to the NIH Clinical Center for an extended period of time, he narrowly limited his sample. As he makes clear, the incidence of schizophrenia tends to be high among broken families and those with a great deal of strife and schizms—the very kind he had eliminated from his study. “We dealt with families where over-involvement with a child and over-protectiveness were more likely to be a factor,” he notes. “If we had not required the families to participate, we might have found other patterns, centered on more overt types of rejection.”

Illnesses can be passed from one person to another in many different ways. They can be transmitted by a microbe, as in bacterial infection; genetically, as in phenylketonuria; socially, in the sense that poor, socially backward slum families live in conditions that are likely to produce a high incidence of TB; or by various combinations of these factors.

To understand the transmission of schizophrenia, it helps to look at other illnesses, Dr. Pollin believes. He particularly likes the model developed by two English researchers to explain the incidence of a very different illness: congenital dislocation of the hip.

Though much simpler and more concrete, congenital dislocation of the hip clearly has genetic as well as environmental factors, as does schizophrenia. It runs in families, with identical twins concordant for it in 40 percent of cases. Yet the majority of twin pairs are discordant for the disease. Drs. Cedric O. Carter and John A. Wilkinson of the Medical Genetics Unit, British Research Council, were able to tease apart the various factors involved.

They found, first of all, that certain aspects of the anatomy of the hip joint were controlled by heredity. If the hip joint is visualized as a kind of modified ball and socket, the shape of the socket—its depth, and the size of its roof—is the key to a good fit. Obviously, the shallower the socket and the shorter its roof, the easier for the head of the thigh bone (the ball in it) to pop out. Yet this shape was determined by a genetic factor. Thus, a genetic factor produced an anatomical predisposition for the illness.

Next, investigating the fact the dislocation of the hip was eight or nine times more frequent among girls than among boys, they found a generalized laxness in all the joints of female infants, which they traced to a flow of hormones from the endocrine glands

of girl babies just before birth. These hormones temporarily loosened the infants' connective tissues.

The condition was also much more common among children born by breech presentation, which bent their legs in a position that favored the thigh bone's popping out. The custom of swaddling had similar effects, mis-directing pressure on the baby's legs; this accounted for the high rate of dislocation of the hip among certain American Indian tribes.

Among the Chinese in Hong Kong, on the other hand, dislocation of the hip was rare. The researchers traced this to the custom of carrying infants in a back sling which, far from loosening the hip joint, tended to push the ball back into the socket.

When twins were discordant for the illness, it often turned out that one twin had been carried in a back sling, while the other had not; one had been swaddled, and the other had not; or else, being of different sexes, they had had different levels of hormones at birth. With MZ twins, the most common difference was their manner of birth: because of the intrauterine mechanics involved, one would be born by breech presentation, while the other was not.

Though the differences between schizophrenia and congenital dislocation of the hip are obvious, Dr. Pollin believes one can draw some cautious but useful analogies between the two illnesses. In both cases, there are many different pathways which lead to the same abnormal structure. The development of the human ego, like that of the hip joint, can be impeded by genetic factors, intrauterine mechanisms, environment in early infancy, social customs, accidents, or various combinations thereof.

It should also be noted that "schizophrenia" is a shorthand word for various forms of mental illness, he points out. When Eugen Bleuler introduced it in 1911, he used the plural: "The Group of Schizophrenias." It is still generally believed that schizophrenia includes several different, though overlapping, disease entities. Eventually, when the total picture becomes clearer, several different patterns of family interaction and biochemical characteristics may be recognized as leading to different forms of schizophrenia.

The Possibility of Prevention

The fact that the majority of twins with the genotype for schizophrenia do not become schizophrenic shows that some kind of intervention is possible: most life experiences do not lead to the development of schizophrenia. "However, so far we don't even know what specific biochemical changes take place at the time of the psychotic break," points out Dr. Pollin. "Nor do we understand why LSD, in microamounts, can cause a break with reality and a florid psychotic reaction. We are still fumbling in the dark

—as though we were trying to treat heart disease without understanding the basic mechanism of the heart.”

Within ten years, our knowledge of the factors that contribute to a high risk of schizophrenia should be at about the same level as our present knowledge of the various factors that contribute to a coronary, Dr. Pollin speculates. He hopes that it will then be possible to state with some certainty which combinations of factors represent a risk high enough to warrant the use of preventive drugs, or which factors in early childhood need to be modified.

“If you understand the specific steps that lead to a disease, you can approach its therapy and prevention from a rational point of view,” he says. “But our treatment of schizophrenia has been quite the opposite—all entirely empirical or accidental. People have stumbled on methods of treatment. The tranquilizers were found during a search for a new type of anti-histamine. If one depends on such accidents, the odds against finding the most rational treatment and prevention measures are very bad. We must define more precisely the specific factors that contribute to a high risk.”

Dr. Pollin cites the work of Dr. Sarnoff Mednick, Professor of Psychology, New York School for Social Research, New York, New York, with children of schizophrenic mothers as an example of the kind of studies which offers the best hope of finding clues to prevention. The children of schizophrenic mothers are a high-risk population. Dr. Mednick expects that, out of his first series of 200 children, at least 50 will become schizophrenic within 15 or 20 years. However, instead of having to depend on their relatives' memories, he will have a complete record of the children's pre-illness characteristics and of the conditions under which they were raised. This will allow him to see what differentiates the children who become sick from those who stay healthy. So far, Dr. Mednick's results fit in very well with Dr. Pollin's for he has found a clear correlation between the development of schizophrenia and the kind of pregnancy and birth difficulties which might have caused damage to the patient's central nervous system either before or during birth. Given a genetic predisposition to schizophrenia, such insults to the central nervous system might well be the factor that triggers the disease.

For the past three years, Drs. Pollin, M. Allen, and D. Cohen have been carrying out a prospective study of their own to better understand the development of personality characteristics and family relationships which—when accompanied by other factors—might play a role in producing schizophrenia. However, unlike Dr. Mednick, they do not anticipate any cases of schizophrenia among their subjects. They are simply studying the origins of certain patterns in the early life of twins. Having contacted obste-

tricians in the Washington area about women who expected multiple births, they asked the parents' cooperation and then did prenatal interviews in the parents' homes. One of the psychiatrists in the section was present at the time of each multiple delivery. If the twins were identical, the researchers kept careful records of exactly how the twins differed at birth, how the birth process itself varied, the neurological findings on each, and their behavior in the nursery. They followed up the twins regularly, first every few weeks, then every few months at home, and from time to time the twins were brought to the NIH Clinical Center for extensive tests and films.

"We wanted to define exactly when the differences between identical twins became consistent. We found that one of them became more dominant, more skillful with objects, more comfortable with strangers, less fearful, at a very early age," declares Dr. Pollin. "Our first group of twins, 10 pairs, is now between 2 and 3 years old, and we are collecting our second sample of 10. We hope that by the time they are 5 years old we will be able to pull together some useful generalizations."

Biochemical Abnormalities that May Predispose to Schizophrenia

Recent studies by Dr. Pollin have singled out abnormalities in the catecholamine system as a genetically determined factor which may contribute to the development of schizophrenia—and perhaps to other psychoses. In Leningrad, in the summer of 1970, he reported his preliminary findings on 19 pairs of identical twins, of whom 11 were discordant for schizophrenia, 4 were concordant (both schizophrenic), and 4 were normal controls. All were inpatients at the NIH Clinical Center in Bethesda, where their diets were similar and samples for nearly all pairs of twins were obtained on the same day.

Each identical twin excreted nearly the same amount of catecholamines as his co-twin. The following catecholamines were analyzed: dopamine (the precursor from which norepinephrine and epinephrine are manufactured); norepinephrine; epinephrine; normetanephrine; metanephrine; and VMA. The intraclass correlation coefficients—which measure the extent to which intrapair similarity in identical twins is greater than the similarity between persons who are not genetically related—were high and statistically significant at values that ranged from $<.05$ to $<.001$, indicating that the levels of these substances were under a significant degree of genetic control.

The similarity remained even when one identical twin was schizophrenic and the other was not. For the 11 discordant MZ pairs of twins, the intraclass correlation coefficients were $+.79$ for

norepinephrine, $+ .77$ for dopamine, $+ .62$ for normetanephrine, and $+ .80$ for metanephrine. "The degree of genetic control present is not submerged or obscured by the presence or absence of schizophrenia," reported Dr. Pollin. "It is especially high for norepinephrine and dopamine."

This was particularly interesting by comparison with the MZ twins' discordant production of adrenal steroids. The catecholamines play two important roles in the body: (1) Some of them (norepinephrine and dopamine, those most clearly under genetic control) act as neurotransmitters in the central nervous system, e.g., norepinephrine in the hypothalamus, the area where emotional activities are integrated with higher abstract activities, and (2) All of them are known to rise in response to stress. However, they usually rise together with other responses by the adrenal glands. Yet in this case, the healthy MZ twins did not show any abnormally high level of 17-OH steroids; only their schizophrenic co-twins did. Thus, the high levels of catecholamines in both twins could not be attributed entirely to the stress of the immediate situation. In Dr. Pollin's hypothesis, they may represent one of the underlying factors that predispose to schizophrenia.

Researchers have long thought that it would make sense if some of the steps leading to serious psychopathology were located in the system that responds to stress. For if one is stressed and becomes anxious, beyond a certain point this anxiety can itself reduce, rather than increase, one's ability to cope with stress. As one's ability to cope with stress decreases, the external threat appears greater, leading to a greater response, and eventually to a pathological spiral.

A man who sees a lion come charging at him responds with a sudden rush of epinephrine (also called adrenaline) and other catecholamines. This brings about many physiological changes. His blood is massively shunted from other parts of the body into the muscular system, equipping him to run twice as fast as he otherwise could. His energy is mobilized for either fight or flight. Useful and adaptive as this response may be to a caveman who often faces dangers requiring physical prowess, it becomes self-defeating in our society, where the threats are more complex, subtle, and chronic. Studies in Dr. Pollin's Lab have shown that high levels of circulating epinephrine lead to a constriction of the perceptual field—they make one see less. Again, the ability to focus on a wild animal to the exclusion of everything else might prove quite useful in a jungle, but in a complex situation it would be better to increase one's ability to make subtle abstract distinctions—the kind of ability which is impaired by high levels of epinephrine. These high levels of epinephrine also diminish the precision of

man's reaction to stress, leading him to over-react in increasingly non-productive ways. In this fashion they can produce the stage of exhaustion described by Hans Selye, in which all ability to adapt to stress is lost.

It is therefore quite possible that the hyper-secretion of catecholamines impedes the development of the ability to cope with stress, and thus leads to schizophrenia. This might be one of the mechanisms involved, together with the non-genetic factors discussed above. In cases of discordance among MZ twins, perhaps one of the twins develops techniques to cope with the hypothetically higher level of catecholamines, while the other does not; then, as a result of his larger number of successes, he develops in normal fashion. Meanwhile his less successful co-twin becomes increasingly dependent, submissive, and constricted, and in the absence of certain kinds of intervention from family or friends, the direction of his development may become irreversible.

Many interesting and important leads tend to implicate the catecholamines in mental illness, Dr. Pollin points out. For instance, most drugs that are able to cause an artificial psychosis are methylated derivatives of amines. Thus, mescaline is a methylated derivative of dopamine. Methionine, one of the essential amino acids, is believed to be essential specifically because it supplies the methyle group, a very common group which plays an important role in body chemistry. And it was shown in this Lab nine years ago that when large quantities of methionine are administered to schizophrenic patients, some of these patients will suffer a severe exacerbation of their psychosis. (This is one of the few biochemical findings about schizophrenia on which there is general agreement.) This leads to the hypothesis that some abnormal, methylated metabolites of the catecholamines are formed in the body of certain persons because of a genetically determined fault; that one of these metabolites is chemically similar to a psychotomimetic drug; and that this metabolite—perhaps a methylated derivative of epinephrine—causes the psychotic symptoms. However, this remains to be proved.

Another lead comes from Parkinsonism. One of the side effects of all effective anti-psychotic drugs known to date is that they produce tremors similar to Parkinsonism. It was originally believed that these tremors and rigidity were an allergic response to the drugs. But it has now been shown that if anti-psychotic drugs are given in high enough dosage, some 95 percent of all patients will develop Parkinsonism. The biochemical basis of Parkinsonism has recently been established—it is a deficiency of dopamine, which among other things serves an essential neurotransmitter role in the basal ganglia, the part of the brain associated with

motor activity. So Parkinsonism implies a lower level of dopamine. A lower level of dopamine implies a lower level of all the catecholamines, since in the body dopamine is the substance from which the other catecholamines are derived. The drug L-Dopa treats Parkinsonism by increasing the level of dopamine. Interestingly, it has had ill effects on some schizophrenic patients. In the past two years it has been used on a fair number of these patients, not to treat their illness, but to treat the severe Parkinsonism-like symptoms developed by some 2 or 3 percent of schizophrenics as a result of high dosages of thorazine. In a significant number of cases, L-Dopa exacerbated the psychosis. This, once again, seems to indicate that increased levels of dopamine and other catecholamines help to produce the symptoms of schizophrenia.

If indeed an inherited biochemical fault involving high levels of catecholamines predisposes certain persons to schizophrenia, it is a fault that might become manifest only if the system were working at high pressure—which brings one right back to the intra-uterine experiences and family factors with which Dr. Pollin began.

"There is something unfortunately seductive about biochemical work," notes Dr. Pollin, an analyst who does not find the analytic and biochemical approaches conflicting, but complementary. "At least it can be quantified! We have fascinating life histories about our twins, each one a novella, but presenting it in a hard, precise way is infinitely more difficult."

He points out that whether the research is approached from the angle of biochemistry or that of family patterns, two issues remain unclear:

- 1) Can his findings be replicated with a larger sample? and
- 2) Which of his findings are specific to schizophrenia, rather than to all psychoses?

His next study will try to get at these issues. From the large pool of twins made available by the NAS-NRC, he hopes to select four matched groups of twins: one group of twins who are discordant for schizophrenia, another who are discordant for depression, a third who are discordant for severe neurosis, and another who are normal. Each group will consist of about 20 pairs of twins. Through extensive biochemical and psychological comparisons of these four groups, Dr. Pollin hopes to determine which factors are specific to schizophrenia, and which are common to all severe psychopathology.

Intramural: NIMH

Dates of Interviews: December 1970 and January 1971

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The Importance of Psychic Medicine: Training Navaho Medicine Men

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"The whole Navajo system of curing clearly takes it for granted that you cannot treat a man's 'body' without treating his mind', and vice versa. In this respect Navajos are many generations ahead of white Americans who are only now beginning to realize that it is the patient, not the disease, which must be treated. Successful physicians who understood 'human nature' have acted on this premise always, but it has found verbal expression and acceptance only recently; at present it is receiving the most publicity in the specialty known as 'psychosomatic medicine.'"

Clyde Kluckhohn

The restoration of a man's harmony with his family clan and universe is a goal that outreaches the more limited aim of medicine today. Yet for the Navaho, healing is total. Navaho medicine is central to Navaho community, family, and religious life and to the health of the tribe in an integrated manner that is quite unlike white medicine. NIMH aid in training medicine men in a region where the traditions have been on the verge of extinction is not only important for the psychic and physical health of the people in the area, but an important example of new paths that are possible in community mental health.

Within this NIMH program six medicine men (also known as singers) are each training two apprentices using the Rough Rock Demonstration School at Rough Rock, Arizona, as their group headquarters.

In the past generations it would not be uncommon for a Navaho man to learn a chant that had helped him personally, and if it were a long ceremonial such as a Night Chant, it might take three solid years of work to learn. During this time he would support his instructor and give him gifts of livestock. Typically, he would

spend several winters with the singer learning an important chant, paying his mentor in food, lodging, livestock, and perhaps his first fees when he was able to practice. In the region near Black Mountain, Rough Rock, and Many Farms, Arizona, lack of money and jobs have made it impossible for younger men to undergo this expensive and consuming schooling. Several years ago, the older medicine men foresaw that their own knowledge would die with them unless help were obtained from the outside. The rituals are elaborate and, for important religious reasons, cannot be filmed. As the writer-anthropologist Joseph Campbell has remarked, these traditions are not of indestructible material, for they exist "only in the living memories of certain old men who survive precariously in the lands of the Southwest desert. The traditions have come down to them from days beyond the reach of memory, spoken, as it were, out of the rocks of the land." The NIMH project indicates that the traditions can be perpetuated.

Each medicine man in the NIMH program is training his two neophytes in one of the important ceremonials. In addition, the entire group is receiving instruction in white medicine. Every two weeks they meet at the Rough Rock School, where they learn about internal medicine, bacteriology, viruses, cancer, X-ray, nutrition, psychiatry and other topics from the lectures of Dr. Robert Bergman, director of the mental health projects on the Navaho Reservation. Dr. Bergman, who is fondly known as Dr. Black Moustache, and who has been honored with acceptance as hatathli (medicine man), has been most important to the existence and success of this program—along with Mr. John Dick, program director from the start, and his bilingual associate, Mr. Frank Harvey, the administrators of the project.

In order to appreciate the importance of keeping Navaho medical traditions alive, it is necessary to understand a little about the Navaho people.

The Navaho medicine man is a combination of doctor, priest, consummate artist, and leader. In many of the ceremonies, conducted for a patient, tribal welfare is explicitly invoked. Perhaps because the Navahos were originally nomadic, they evolved no strong central leadership, and the medicine men became the main carriers of culture—the enlightened leaders of the group. As cultural leaders, they are often kind, shrewd, fatherly people, conservative, and dependable. Although they are for the most part eager to cooperate with white, modern medical clinics, their own sphere of influence extends beyond medicine, to the restoration of peace to the troubled people.

Such a man comes to his role late in life. Trainees may be 45 or 50 years old when they begin to learn ceremonials. Although it

may not be apparent to the outsider, an elaborate ceremonial requires a trainee to learn, entirely by rote and through observation, as much information as he would be required to know for a Ph.D. He will acquire hundreds of chants, learn intricate sand paintings, legends, and a pharmacopoeia consisting of 150-200 herbs. Each medicine man is a specialist, for not even the most learned man knows more than four or five of the elaborate ceremonials (depending upon the way they are cataloged, there are about 45-50). Women rarely enter this calling, although there is no prohibition. However, this role calls for the most extreme endurance, an ability to resist the worst weather, traveling in winter when the roads are impossible and the winds severe, and working almost around the clock for as long as ten days in the longer ceremonials. Only one woman has become a trainee in the NIMH project, and she is already practicing as a medicine woman for special sections of one chant.

The skills of the medicine men are varied, integrating both practical and symbolic remedies: They set fractured bones and administer a variety of herbs to counteract fever, insomnia, pain, but the most important impact is psychic. Depending upon the need of the patient, the singer draws from his complex of rituals, prayers, songs, and paintings, and dances—which may be simple, lasting only a day and a night, or which may continue for nine nights and ten days. These ceremonies relate parts of the Navaho mythology, centering around men and women heroes who have made mythical journeys to the lands of the Holy People, the *Gos*—or *Yei*—and who have brought back supernatural powers for the benefit of the patient and his family. These rituals combine the highest art forms—poetry, song, drama, dance, and painting.

The rituals, which generate psychic healing, include blessings and prayers accompanied by the painting of the body and the swallowing of corn pollen. Purification rites include the use of sweat baths, emetrics, and ritual baths with yucca suds which often conclude a ceremony. Unravelling a wool yarn wrapped around feathers and herbs, setting out painted prayer sticks, and offering painted reeds stuffed with wild tobacco all attempt to induce the holy powers to the ceremony. Lengthy song sequences are sung in a prescribed order. All but the very short ceremonies involve the creation of a symbolic design, a magnificent sand painting, showing some stage in the Navaho people's emergence from the underworld, and miraculous events in the lives of cultural heroes. The pigments for the design are made of ground rock and sand and are "painted" on the smoothed sand floor of the ceremonial hogan (the octagonal Navaho house) by a carefully released trickle of color between thumb and forefinger. It is a

difficult skill. A very simple sand painting may take only four hours to construct, but the dry paintings may also be so large and elaborate that a dozen men will work for hours. Immediately after completion it is sprinkled with pollen, or white corn flour, and blessed. The patient will then sit on it, while the medicine man transfers to his body the power concentrated in the painting. Long positive prayers are recited which the patient may repeat line by line. Immediately after the ceremony the sand painting is destroyed and scattered to the four directions from whence its power derived.

Each ceremony includes some combination of these elements. The Long Night Chant, for example, concludes with the dances of masked figures representing the Yei—the famous Yei bet chai dance. The well-known squaw dance and fire dance are also part of longer ceremonials.

Background

The Navaho nation, of about 115,000 people, is the largest indigenous nation left in the United States. The Navaho people live in the high, arid, desert plateaus and canyon country of the Four Corners, where Utah, Arizona, New Mexico, and Colorado join. Most of the reservation is in Northeastern Arizona and Northwest New Mexico, largely a dry, sage-covered table land cut by deep canyons, punctuated by brilliant red rock formations—a beautiful land, but capable of supporting only a most tenuous animal survival.

Little of the land is usable for agriculture, and although it is heavily grazed, the many poisonous plants, storms, and inclement weather make it hazardous even for sheep and goats. The reservation, checkerboarded with leased lands around the borders, puts about 18 million acres in Navaho hands, a restriction imposed by the American Government. Originally, when the Navahos roamed freely, hunting, they lived on a considerably larger terrain. The population density, while low, is over twice that of the adjacent rural areas owned by whites. Navaho per capita income in the more isolated areas is around \$700 a year—some of it from crafts, from resources such as wood and minerals, much of it from wage work. The national per capita income is about four and a half times that of the Navaho.

Originally, these free-roaming people must have migrated from the North, or so anthropologists believe, judging from their language which belongs to the Athabascan language group spoken in Alaska and Canada. They may have arrived in the Southwest around 1500 A.D. where they absorbed some of the culture of the Pueblo Indians, and later the Spanish, who brought horses, sheep,

and goats and instigated crafts such as weaving and silversmithing. Not technical innovators, the Navaho were esthetically gifted, and in the myths by which they explained their origins on earth and their place in the universe, they paid homage to the beauty of the land which they felt to be a part of them—not separable, and therefore not strictly ownable. As the first Anglo explorers ventured into their country in the early nineteenth century, the Navaho first encountered a culture in which land was considered primarily property, and property was the paramount value—over life, itself.

In their conflicts with the whites, the Navaho were not militaristic; unable to combat army units, they fought the incursions of whites by raiding settlements and towns. In 1846 the first U.S. Government military expedition was launched against them, and instead of fighting pitched battles, they scattered. After the Civil War (1862), Kit Carson was ordered to destroy all their crops and livestock in reprisal for continued raids. The land was systematically pillaged and the people were driven into the mountains. In winter, with no game to hunt, no crops to eat, they were trapped in the deep canyons branching from Canyon de Chelly, freezing and starving in the caves of ancient cliff dwellers. For those who did survive the choice was death or captivity.

No one can understand the attitude of Navaho people toward white Americans without taking into account The Long Walk of 1864 when about 2,500 people, old, maimed, and sick, trekked the nearly 200 miles to Santa Fe where they spent over four years in an imprisonment that has marked their consciousness as strongly as the bondage in Egypt has marked the Jews. Eventually 8,000 Navahos were herded together with Apaches and other tribal groups on a military reservation best known as Fort Sumner and were set to work "farming." It was a massive disaster. In four years a thousand Navahos died—an eighth of the tribe. Finally, in 1868, the Government of the United States freed the survivors because the cost of clothing and feeding them was too great. In a state of shock, illness, and despair, 7,111 Navahos returned to the designated acres, some 5,500 square miles of windswept desert. The shattering effects of The Long Walk and of Fort Sumner have never been totally forgotten, and this reverberation, combined with other conflicts imposed by a dominant white culture, have created anxiety throughout the growing tribe, and ambivalence in the young toward white culture.

The psychological emasculation of the tribe has been enhanced by realistic social and economic situations for those who want to work and live in white communities. The Indians are paid least, and are socially lowest on the hierarchies of Western towns. The

first schools for Indians were either missionary schools or Government boarding schools, in which Navaho culture was ignored and deprecated. Children were hit with rulers for speaking their own language and even today are subjected to unthinking humiliation. Despite boarding school training for life in white communities, 95 percent of the children have preferred to go back to their families, rather than to white communities, only to discover that they could not even participate easily in their own culture since they did not know the customs of their own people. Only recently has there been a movement toward bilingual schools, directed by the Navahos, themselves, of which the Rough Rock Demonstration School is the first completely Navaho controlled school. For many Navahos, who serve in the U.S. Army, or do business in a white community, the dilemma of living between two worlds and of being treated as a child or as inferior asserts itself continually. With painful surprise the Indians relearn that they are not considered equal.

The premises of Navaho life are almost the antipodes of the American code. Family and clan are the all important units of life, and it is a matrilineal society, one which is respectful of individuals, but in which it would be unthinkable for a single individual to make decisions for a group. Long before the existence of sensitivity training or group dynamics, the Navahos adopted a mode of group process, which by long and tedious interchange permits decisions to be made by group unanimity. Individual success is not a value, and it seems fundamentally indecent for a "leader" to take power over others. Nor is property a primary value, for after a man has amassed enough wealth to provide for his family and be comfortable, further riches would merely generate suspicion. A good member of the tribe would be healthy, strong, generous, and dependable—a person who was able to get along with others.

In crisis and under pressure, the white American code says "do something," without specifying what. Navaho culture says the opposite. Instead of fighting, escape, and instead of action, do nothing—passive resistance. If Americans seek to tame nature, Navahos seek to live in respectful harmony, lest nature destroy them. If Americans encourage individualism, the Navaho encourage cooperation and respect for the individual. In family situations husbands and wives do not try to control each other, and children are consulted in matters regarding them, so that a child who adamantly refuses to go to school will not be forced to go, nor would any article of the child's be given away without his permission. Security comes from group respect and cooperation, beginning with the family. Love of life and adherence to tradition are more important than work and technical innovation. Navaho people accord prestige to a person who knows many songs, as well as

to one who owns (for his family) many turquoises. All aspects of nature have gender as the Navaho see it and are fully integrated; for example, there are sudden downpours that are male, gentle drizzles that are female; the rushing San Juan River is a male water, the placid Rio Grande, a female water. There are male and female chants, and in prayers and sand paintings, the supernatural female and male components are almost always paired. Although the Navahos observe many sexual taboos (people from the same clan never marry) and are somewhat shy of nudity, no stigma is applied to sex itself, which is considered as one would consider normal hunger. Living as they do, in small houses, families in tight quarters all winter, the Navahos have adopted a very cooperative, group-oriented mode. Even in their profound religious mythology there is no way of tracing the day of creation to one figure. Unlike the solitary Judeo-Christian deity, or the Holy Family, the Navahos trace themselves back to a group of Holy People, and to a union of the Sun and their favorite mythic character, "Changing Woman," who is somewhat mother of the tribe. Much of their belief system resembles that of the Buddhist, in which linear beginnings and ends and hierarchies are far less pronounced than in Western religions.

Given these many fundamental differences between Navaho and white culture, it is easy to see how even well-intentioned missionaries, school teachers, and doctors have unwittingly pained and frightened these people. White medicine assumes a dualism of soul and body, but the Navaho see personality as a totality, a totality that is, moreover, a part of a family, clan, and terrain—a person is a whole entity, inseparable from the ecology of his clan and tribe. Medicine is not only dedicated to restore the health and harmony of the individual, but to restore family, and clan ecology, and any segments that have become disharmonious with nature.

Some of the differences in thinking and expression that have placed Navahos and white Americans in conflict have been typified by the translation difficulty of differently structured languages. Navaho is a tonal language, like Chinese, in which the meaning of a word may be altered by pitch, accent, and by interruptions for brief glottal stops. It has a slightly percussive and sing-song quality to the unfamiliar ear, and contains consonants (such as "tls") that are never heard in English or European languages. A literal and very specific language, Navaho does not have the abstract properties of English. If one were to use the verb "to go," one would have to specify by what mode of transportation. Because the two languages are not structured similarly, translation becomes difficult and the translator becomes an interpreter.

Ceremonies, Myths, and the Creation

One cannot lose one's direction for very long in Navaho land. Sooner or later one is bound to come upon a hogan, an eight-sided house with a round mud roof and a door always open to the East. The hogan in which traditional Navahos live is a miniature of the essential form of the Navaho universe, the eight sides representing the four quarters of the world and the points between. Thus, the individual living within this icon is always reminded of the mystic form of the world and of his own self, a reminder of the quintessence of psychic wholeness and cosmic harmony. To live in such a dwelling is to be reminded always of the life healing properties of the universal design in which one fits, for it is an orderly universe, containing both good and evil, benevolent and dangerous aspects. Improper contact with the dangerous elements of the universe—lightening, certain animals, the ghosts of the dead—may result in an imbalance that manifests itself as disease. Universal harmony may only be restored by the proper ritual.

The ceremonies reflect the oneness of Navaho feeling with the land from which the tribe emerged and its history. The legends which underly all the rituals reiterate a part, or a branch, of the Navaho story of creation. The story of emergence begins with the dual forces, male and female personified as the First Man and First Woman, and the Holy People, who created a four-cornered universe, a firmament, water, and earth. In a progression that is remarkably parallel to scientific descriptions of biogenesis, the Navaho myths describe the pre-human world of insects, animals, and pre-people living beneath earth, until they were routed by flood and ascended to the earth surface through a hollow reed in a lake. The myths describe the receding sea, which once covered that land, and the four sacred mountains that bound the territory. In Navaho mythology there was no unique progenitor, but the favorite figure, a mother earth, known as Changing Woman, who brought time, changing seasons and age. She appeared one day as a baby in a cloud and her union with the sun brought her sons to rid the world of its primeval monsters, giant malevolent eagles and animals, perhaps resembling the dinosaur ancestors of today's animal life. Changing Woman created the light of dawn with white shell and crystal blue for morning, yellow for sunset, and black for night—the changes of day and night. These are the primary colors of the ritual paintings, whose symbols are painted with ground rock shell, pollen, charcoal, and dry pigment upon the sand covered floor of the hogan.

Navaho mythology is truly American, and as such is indeed foreign to most Americans. Most white Americans are steeped in

the legends of the Middle East and Europe, the Judeo-Christian myths and European culture. Navaho legends have no such hierarchy. The pantheon of mythical figures and heroes encompasses many supernatural representations that come directly from the American terrain, but that nevertheless seem strange to white Americans. There are eagle, coyote, bear, porcupine, deer, and gila monsters. There are many varieties of wind. Living on a hard land in a high country exposed to the vagaries of natural violence, the people came to respect and mythologize the relevant elements of their world. The characterization (and fear) of winds is sensible in a dry terrain where sudden violent wind storms are frequent. So, too, are the subtle differences in lightening in a country where almost everyone sees lightening strike a tree, house, or even an animal or person in the course of his lifetime.

As the heroic first people set out to make the earth liveable, they were put to the eternal tests of all heroes in all religion. As some writers have pointed out, their sagas suggest stages in psychic development. The tests, first of physical self mastery and then of progressively advanced consciousness, suggest the stages through which Buddhist yogins must pass on the way to enlightenment. Only after physical, mental, and spiritual tests have been passed can an individual reach harmony with the cosmos, the Center, the thought. Curiously enough, there are quite a few similarities between Navaho and Buddhist symbols. The Buddhist universe began with the four petalled lotus: the Navaho universe is a lotus shape, with Encircled Mountain in the center, and the four sacred mountains in the four directions. Each is represented by its directional color: yellow, white, blue and black. These colors also indicate greater or lesser spirituality, and in sandpaintings no speck of color is without its specific meaning.

It would be impossible to precis the entire emergence legend, rather like attempting to digest the Bible. However, the myths are well described in many books, and with particular color by Frank Waters, in *Masked Gods*. The central legend is that of *Emergence*, the story of the creation, and the sagas in which earth was made liveable first by the Hero Twins who slayed the monsters, and then by the first people. It is the story of chaos put to order, of violence turned into balance. Order and harmony are most prized by the Navaho people, and their most important ceremonials celebrate that beauty which is the closest that humans may come to perfection. The Beautyway and the many prayers in which the word "beauty" is used refer to more than aesthetic—probably to that harmony, goodness, and joy which is the closest humans come to perfection. Navaho medicine is part of a life and philosophy that is an integrated whole.

Ceremonials for Healing

The ceremonial of consequence is conducted in the hogan, a specially constructed octagon sometimes 6-20 feet in diameter with log walls, sealed with mud adobe. The door opens to the East. A hole in the center of the domed ceiling lets smoke out. The hogan is empty, but for sheepskins and blankets spread around the perimeter. To the north, men sit on these; to the south, women and children. Occupying most of the floor is the sand painting which will give the patient contact with the supernatural world. The medicine man's feathered and carved prayer sticks are stuck in the ground around the painting. A weasel pelt, abalone shell, and the ceremonial basket of pollen are there. Hot coals are placed in some rocks near the door and kept glowing. A pan of water is used for mixing herbs and a large flat stone is used as a pallet on which pigments, mixed with water, will be painted on the patient. The patient is the center of all focus. His family are gathered around. All wish that he shall be restored. It may take nine nights and ten days. It may cost more than the family earns in a year, but it is generally welcomed, a time of drawing together, of healing family rifts, of glimpsing once again the fundamental magic and mysteries that we call religious. It is a far cry from the hospital in which the white patient is isolated, visited for a few hours of the day, administered medication, left alone.

As one man put it:

"You go to a hospital and maybe once a day the doctor comes around and he stays there, maybe five minutes. He talks a little bit but he asks you questions. Once in a while they give you a little medicine, just a little of it. About the only thing they do is to put something in your mouth and see how hot you are. The rest of the time you just lie there. But the medicine men help you all the time—they give you lots of medicine and they sing all night. They do lots of things all over your body. Every bit of your body is treated."

Many white Americans also complain that their medicine is not sufficiently oriented around the patient and his life. It is impersonal, as if mind, body, and life and health could be treated separately. The rituals of white medicine, such as they are, involve the white coat, the authority and knowledgeability of the doctor. In psychiatry they may also involve payment. These are not rituals that reach meaningfully into the lives of patients. Thus, while Navahos seek out white medicine for many kinds of ailments, recognizing its superiority for setting broken bones, surgery, treating infection, they do not expect it to restore to the individual his sense of health and integrity.

The bolstering attendance of family and friends, the authority of the medicine man, and the invocation for reinstated good health

are doubtless important in healing. The patient is actively doing something about his illness. He participates in the ceremony and its costs. Moreover, powerful forces are being amassed for his benefit. In the sand paintings, songs and prayers, a cultural hero makes a symbolic journey on his behalf. If the cure is mediated by the action of these important symbols on the unconscious, the symbolic chants and prayers also bring order to the suffering that is ordinarily chaotic and disruptive. The subterranean origins of the confusion, or pain, are given a symbolic expression that is shared with all. The bear, lightening, snake, tschindi (ghost) are fearpoints capable of causing illness in all, and the symbolic conquests by the cultural heroes are on behalf of all who encounter such mishap. Instead of isolating the patient all possible means of supports are drawn together, the family, clan, friends, and the symbolic history they share.

Each Navaho ceremonial is a complex series of ceremonies, which has a name, legend, and consists of chants, prayers, and rituals. A chantway (such as the Holyway or Beautyway) consists of hundreds of separate chants, prayers, and rituals of which some may be added or omitted, depending upon the requirements of the patient. In one ceremony the singer will consecrate the hogan with corn meal and oak sprigs; in another the singer will set out his prayer sticks, and if the chant is long (five to nine days), the patient and his kin will purify themselves with an emetic and sweat bath at dawn on four occasions. On the morning of the last day they will bathe in yucca suds and the sand painting will be started. On that last day, when the complex painting is finished, it will be sprinkled with corn meal, and the patient's body will be painted with symbolic designs, a bead and plume tied in his hair, and he will sit on the sand painting while grains from its design are sprinkled on his body. By this contact with the supernatural beings represented in the painting, the patient acquires their strength, and must restrict his behavior for four days lest he be of harm to others. The sand painting is immediately erased, and all night singing follows.

Throughout the ceremonies the medicine man sings, rhythmically shaking a rattle, joined by the men in the hogan. He prays, and communal prayer closes most ceremonies, after which everyone swallows a pinch of corn pollen from the prayer basket, and inhales a herb sprinkled on the coals of a small fire. Throughout most ceremonies herbs are mixed with water and administered in cups of abalone or turtle shell. Special objects are taken from the pouch of the medicine man and these, with other materials, are touched to the patient.

Most of the chantways are healing rites, although the Blessing

Way may be used protectively, to consecrate a new building. This ritual, which gives strength and inner peace, is conducted over young men who are leaving for war. There are rites of passage, too, such as the celebration of menarche among young girls. Certain rites may be used to combat witchcraft, or to compensate for the unwitting breaking of a taboo.

However they are used, ceremonials combine the highest art forms, empirical herbal medicine and psychic healing. In Navaho life there can be no health without harmony. The ceremonies, with their hundreds of songs, rituals, dances, prayers, and sand paintings are at the center of Navaho survival. They are essential to the strength and identity of the people.

Although a number of writers have described certain of the ceremonies, written materials would not be sufficient for an individual to learn how to collect and prepare the hundreds of herbs, construct prayer sticks and ritual objects, intone the chants, as well as stage, costume, and choreograph the dances. Sand paintings, which are a symbolic interface with a spiritual world, are not considered art, whatever their magnificence. No sandpainting is intended to be photographed or copied, but is solely a bridge between the patient and the spirit world. Within a few minutes of completion, corn is scattered over the painting and the patient sits upon it. He knows that it was done solely for him, and that it is perfect in every detail. Sand paintings prepared for reproduction usually have substitutions of colors, details which are omitted, changes which make them secular rather than sacred. Moreover, the medicine man himself is the object of respect and sometimes fear; his knowledge is considered powerful. Thus the healing art—a fragile heritage that has come fearfully close to dying—can be learned only by imitation and instruction.

Medical Attitudes

No Navaho would build a hospital without one or maybe several ceremonial hogans just outside the door, so that individuals might be speeded into psychic recovery. It is indeed strange that so many hospitals exist on and around the reservation, without provision for the native medicine. Dr. Bergman, who has been trying to accomplish a closer cooperation between hospital and ceremonial medicine, recently gave the NIMH-sponsored medicine men and their trainees a tour of the Gallup Hospital. To a man, they were all impressed with a singular view of an important mountain which they had never before seen from such a vantage point. But the sterile pediatrics ward filled them with horror for there were no parents around, helping to care for the children.

Indeed, Navaho look upon young American doctors as extremely

young. A Navaho boy may begin to learn chants and rituals from a relative when he is young. Many esteemed singers used to begin their years of apprenticeship around puberty, but that is much less likely today, since most of the children are in school. Although several years might be needed to absorb in detail one of the more elaborate chantways, there would be no hurry. A Navaho would not be considered ready to practice as a singer until he had reached full maturity, his 40's or 50's. Navaho concept of the singer, like that of the sing, require a wholeness. Thus the medicine man is no youth, but a person who has brought up a family. The community must watch him, see that he is able to survive and function in his family and clan and in the larger community. When he has passed the tests of life he may try to help others. Moreover, he should have proved himself to be a good man, someone who will not misuse his power.

In the light of these criteria, it is not surprising that most of the trainees in the NIMH program are over 40. A Navaho is very young until he passes 51.

Before he may practice medicine, a Navaho must be a mature and seasoned man for there are many hazards in being a singer. The very nature of rituals is that every detail has a significance: the medicine man must perform his ceremonies without the error of a syllable or one inappropriate detail in a sand painting for if he should err or commit some infringement of tradition, he might do the patient harm. A singer must not lose too many patients. Moreover, if he becomes too successful and wealthy he may be accused of causing illnesses in order to collect fees for curing. His psychic powers are real, and the medicine man is likely to generate ambivalent feelings. In order to abate envy, he is likely to affect a modesty of manner and dress that does not belie the extent of his knowledge and wealth. In a society where knowledge is esoteric, songs are indeed a possession.

The medicine man, who is a combination of physician, teacher, psychiatrist, and priest, spends a part of his time at ceremonials practicing family therapy. Since families live together in tight quarters during the winter, often in one or two hogans, there is little privacy, and tensions are likely to create rifts, ultimately generating psychosomatic symptoms. Although white medicine treats symptoms to a very large extent, Navaho medicine is not aimed at the symptoms—the stomachaches, headaches, depression—but at the causes.

Causes of Illness

Illnesses in Navaho medicine are traced back to first causes, which are expressed symbolically. Although they may seem

strange to urban Americans, the psychic roots of illness are not so different from the causes of familiar psychosomatic and emotional illnesses—depressions, cardiac illnesses, and other ailments that seem to originate in traumas, insecurities within a family, or taboos inculcated in early toilet training. However, as expressed by Navahos, in their own environment, the mythical causes of illness may be powerful animals such as the bear, eagle, deer, coyote, or snake. Lightning, wind, ghosts, witches, and foreigners are also a threat to the Navaho security and health. A person who has been hurled about in a cyclone, touched by a whirlwind, or even a dust-devil, may later be affected with a twisted mouth, headaches, or paralyzes that require the performance of a Wind Chant.

In white medicine there is a division between illnesses affecting the mind, and those of the body. No busy white doctor would encourage his patient to tell him their dreams. But dreams are considered prophetic among the Navaho. As one medicine man remarked: "Dreams are very important. They tell you something that's ahead of you, something that will happen. You whites don't do that, but we Navahos think it's important. For example, if you have a relative or close friend that's dead and you dream about him it's a warning that his ghost is coming back to affect you. Then you need prayers."

No one could possibly get through life without some infringement upon taboos. Perhaps one unwittingly walked in the track of the mountain bear, or ate lamb that had been slain by bear, or as an infant saw a man struck by lightning, or unknowingly entered what later turned out to be a ruin where ghosts of the ancient dead would be. Contact with the dead may ultimately be a cause of illness.

The topic of greatest anxiety for Navahos is death. The house in which someone dies is ever after considered haunted and should be burned, since no part of it is free of the ghost, *tschindi*. Touching, looking at corpses, all things concerning death have threatening, even overpowering implications for the Navaho. Death and hardship are common among these people. When a family member dies, preferably removed from the family hogan beforehand, he is laid in a casket with all his personal possessions, and set in the rocks. (Today Navaho are often buried by non-Navahos, but the same taboos apply to personal possessions.) For four days, whoever of the survivors has touched the body must purify himself, remaining apart, and stifling his grief as best he can, lest spoken words of the dead cause illness. The dead are said to exist in a perpetual underworld and their ghosts may be evoked by malicious witch-

craft. They haunt dreams, and appear in visions, wrecking mischief and causing illness among the living.

In this context the white hospital presents a threat to many traditional Navahos, and probably evokes unexpressed anxieties in the acculturated young. Although even most traditional Navahos take people with certain kinds of illnesses to a hospital, a white hospital is looked upon as a place where people sometimes die. They are not taken outside to die, thus the hospital is seen as a place of ghosts.

There are many indications of this sentiment, such as this instance from Gladys Reichard:

"She was taken home and word came that little Singer had died in the hospital—his being the fourth death there in a week. R.P. was prevailed upon to consult a doctor for his wife. He consented but reluctantly, because he would have to go to the hospital, the place of the dead."

Witchcraft

While white men are modulated by external mechanisms—government and the law which enforces in absolute authority—the Navaho has no such authority. Navahos regulate their behavior as a group by social sanctions, of which witchcraft is one.

If contact with the dead may generate nightmares and later illness, like the infringement of a taboo, accidents and disease could be emanating from another source—the evil desire of someone to harm the individual, also labelled witchcraft. Psychological blackmail, in the form of witchcraft is common, and provides some social sanctions of value to the tribe as well as exacting a heavy toll in anxiety and illness. A man, for example, who became too rich would be suspected of witchcraft, if not robbing graves. Thus, the well-to-do are tacitly encouraged to share with their families and clans, to give ceremonial feasts that are generous.

The people most likely to be suspected of witchcraft are the very rich, but also the very poor (who may use evil means out of desperation), the very powerful singers, who are envied, and the very old, who are likely to be neglected family members, toward whom there may be some family guilt and some fear of repressed aggression. Moreover, the very old, by nearing death are almost ghosts.

All societies have their witches, objects of repressed hostility, to blame for whatever goes wrong, the projection of hate and fear. In some sense they were Jews to the Nazis. Today, to many Americans, they may be communists, blacks, or students. Their intentions are interpreted as evil, and they are feared, and ultimately may be forced into becoming fearsome. The word witchcraft is strange to many Americans for whom the parallel phenomena are

often institutional—evils of the IRS, a company, an agency, corporate and faceless, out to do in the mere individual.

Witchcraft increased, so scholars think, after the humiliation of Fort Sumner, when the Navaho people had to begin from the beginning and reestablish their lives. It seems to be increasing now, an expression of rising anxiety perhaps at a time when the pressure of white culture is causing much conflict in the tribe. Families are breaking up; families which are the crux of tribal equilibrium. Young people, educated away, cannot live with the old traditions in the old hogan, nor do they wish to live as second-class citizens in American cities. The Navaho population has grown, but the arid land will not support it. White industries threaten to invade sacred lands: the tribe profits a little from coal or uranium concessions, but in some current instances the younger people see that the industry will profit immensely, giving the tribe a small fraction for a concession which will destroy holy land and perhaps also part of the watershed. It is not surprising that fear of white people runs like a silent thread among the older generation. There are many taboos about contact with whites, who have brought not only misery and exploitation, but many disease epidemics. Yet for those whites who have brought good, the Navaho response is warm and loyal.

The NIMH training program has been warmly welcomed, in part, because the white participants have been so respectful of Navaho tradition, and in part because it offers the medicine men additional training in the medical fundamentals that white doctors use so heavily for diagnosis. This is a major difference between the Navaho medicine man and white doctor: the doctor's training emphasizes diagnosis, while diagnosis is not even part of the medicine man's traditional role.

Diagnosis

Navaho diagnosis of illness is performed, not by the medicine men themselves, but by less eminent persons, people who are not necessarily learned but who are able to utilize trance states and visions. These people, known as star gazers, crystal gazers, or hand tremblers, spend time with the person who feels ill; ultimately they divine the cause, and tell the person which ceremony to have. The rules for diagnosis are not spelled out; rather, the good hand trembler or star gazer incorporates considerable information about the person to be treated in the diagnosis. For instance, a person who is unable to resolve grief, who has chest pains, and unusual fears of accident, usually will be told to have an Evil Way Ceremony. If the ceremony does not bring the patient back to health and cheer, the diagnosis may have been wrong, and the

person will seek out another hand trembler. It is not possible to obtain statistics on the recovery rate of Navaho ceremonial patients, but they would seem to be reasonably good. There is, of course, a considerable elapsed time between diagnosis and ceremony in many instances, for once the ceremonial has been prescribed, the family must begin the process of engaging a singer.

Fees are discussed in advance, and are graded by the medicine man, who will expect very little from a poor person but more from the rich. Thus, a Night Chant might cost a poor person only half as much as a rich man. If a night ceremony is prescribed, the fee may be \$200, but the cost of special materials and food for the invited family will run to \$1,000—over a year's income. In addition, special herbs and materials must be gathered for the singer. The hogan must be cleared for the ceremony. Unless it is a grave emergency, this preparation may take weeks. The singer may need to gather special herbs and pigments. In the end, however, the ceremony is a healing experience for everyone—patient, family, and all invited. If the aura of a hospital, or individual psychotherapy usually has lugubrious overtones, the Navaho ceremony is extremely jovial and positive. Prayers are far from supplicating. They are declarations of the healthy future.

"Today you must make me well. All the things that have harmed me will leave.

"I will walk with a cool body after they have left me.

"Inside of me today will be well, all fever will have come out of me, and go away from me, and leave my head cool!

"I will hear today, I will see today, I will be in my right mind today!

"Today I will walk out, today everything evil will leave me, I will be as I was before, I will have a cool breeze over my body, I will walk with a light body.

"I will be happy forever, nothing will hinder me.

"I walk, in front of me beautiful, I walk behind me beautiful, under me beautiful, on top of me beautiful, around me beautiful, my words will be beautiful.

"I will be everlasting one, everything is beautiful."

Training in White Medicine

Hatathli Black Moustache, as he is affectionately called, is one of these—a man who can combine appreciation of tribal custom and belief with Western medicine and administrative skills. With the aid of an interpreter, Dr. Bergman has been lecturing the NIMH trainees on first aid, the nature of blood cells, bacteria, viruses, on cancer, X-rays, anatomy. Seated in a small classroom or library at the Rough Rock school, the medicine men and school staff sit with arms folded, eyes often closed, for many hours.

Accustomed to memorizing, they may appear to sleep until the lecture is over, when they open their eyes and ask astute questions. They appreciate the instruction and have revealed through their questions a considerable knowledge of physiology and anatomy, perhaps gathered from studying animals. These classes give the medicine men some insight into the functions of the white doctor, without in any way depreciating the value of psychic medicine.

Where White Medicine Fails

Almost everyone can relate a case or two in which a Navaho has been healed by a chant when hospitalization and treatment in the clinic failed. There is the woman who underwent a gall bladder operation, but continued to feel badly when she came home, until a Blessing Way was sung. Then she recovered. There was the woman who had been in Fort Defiance Hospital with severe facial tics, and was discharged by a doctor who hoped that a ceremony would succeed where he could not. Three months after the ceremony, one of the guests who had been there, stopped to give the woman a ride, but did not recognize her without the disfigurement of muscle distortion.

Mr. Frank Harvey, interpreter and administrative assistant of the NIMH training program, recalled a very emotionally disturbed girl who seemed only to get worse in the hospital. Finally she was given a Mountain Top Chant. "Now," said Frank, "she's so thrifty!" which is a high compliment and implies competence. The girl is married and caring for her family.

The most striking case was the case of the cured schizophrenic. Dr. Bergman had seen records from four different hospitals, all diagnosing a woman as schizophrenic, but when he tried to check on her she was nowhere to be found. Her father said there was no point looking for her because she was well.

"We found her in her hogan with her mother and brother and a bunch of her kids. She was spinning yarn, was well organized with the kids, and not shaken by us and she and the rest of the family put the story together. They told how one time she thought people were poisoning her, how at other times she'd think people were breaking into the hogan, so she'd get a gun and go prowling. . . .

"In addition to the hospitals, they'd tried every imaginable cure—Navaho herbs, and the Hopi Sucking Cure, and the Apache Windway Ceremony. Finally they took her to a new hand-trembler who said: 'There's only one man who can help. He's a very old man and he lives over at Grey Mountain.'

". . . Finally Large Whiskers agreed to treat her, but he

said the cure had to be effected where the illness had started and with the whole family around. . . .

"They all went back then to Blue Canyon, and the woman told us that, from the first night on, she was sure that she was going to get better, that listening to Large Whiskers pray and chant she knew her normal mind was returning."

Dr. Bergman was curious, having seen the hospital records. Most psychiatrists hope to allow schizophrenics to function but never hope to cure them. Nonetheless the woman was obviously well, and Bergman went to meet the medicine man, Tom Large Whiskers. Asked how he had cured the woman, the old man said:

"I don't know what you learned from books, but what I learned from my grandfather is that there is a part of the mind that is outside of the person, and which the person does not really know about. That is the part of the mind that is most important in determining whether somebody becomes well or remains sick."

In addition to working with the woman's unconscious, he had also used two very potent herbs, picked so that they would be strong enough, but not too strong. If one listens to the medicine men with the sensitivity of Dr. Bergman, one discovers many of the concepts of psychoanalysis, explicitly stated. The analogues of the id, ego, super ego, and of the unconscious, or transference are expressed as external forces. Nonetheless, the medicine men do consciously work with the unconscious of their patient.

Since the medicine man must counsel and consult with the family, he informally conducts family therapy during the ceremony. Some ceremonies thus have periods in which they resemble encounter or sensitivity groups. Some of the longer ceremonies, lasting nine nights and ten days, also involve intense activity and little sleep, resembling the compressed therapy of the encounter marathon.

Moreover, the ceremonies selected for the individual contain mythological and symbolic components that are suited to the psychodynamics of the patient's illness. They take away from the total helplessness of the sick, and turn the despairing toward positive health. Groups can benefit from ceremonies in a similar way. One striking example occurred during the author's visit to the reservation. One dormitory of the Toye boarding school had been supervised by Dr. Bergman and developed along Navaho concepts, despite resentment and objection from parts of the school community. Then came a period in which a staff member died, a relative of a staff member died, there was a nearly fatal appendicitis attack in one of the children. In the grief and agitation, everyone began to get sick—with symptoms of streptococcus

infection in the throat. Dr. Bergman suggested at a staff meeting that it might be appropriate to hold a Blessing Way to consecrate the new dorm and its ceremonial hogan, and to protect the group against the possible ill feelings and evil being directed against them. The groups response was one of instant relief. Anxiety and agitation subsided as they discussed the practical matters of hiring a singer, preparing food, and inviting the families of all. Instead of feeling helpless and sick in the face of death, ill will and sickness, they had something positive to do and looked forward to. Moreover, it would mean drawing together a huge assemblage of relatives and parents. Ceremonial "medicine" can be an important part of community mental health.

The Need To Preserve Traditions

The medicine man is an invaluable repository of tribal knowledge, of pharmacology and symbolism. Without him the traditions, and for many Navahos the purpose of life, would vanish. He is the integrator, the wise man, the artist. Although many Navahos live in two very different worlds, even the most urbane and acculturated members gain sustenance from the ceremonies. One well-traveled administrator remarked that he had had the Blessing Way twice, once to protect him before he went into the Armed Service. Indeed, when he is troubled, pressured by work and anxious, he will call a medicine man for a brief prayer. When he lies down in the hogan, receiving the pollen and repeating the prayer after the medicine man, he is reinvigorated, confident, and happy again to be alive, and can return to work.

Medicine in Navaho terms is integral to the life of the individual and to the entire region and tribe, bearing an importance in social life that it does not have in white communities. Thus, the loss of the singer would be a disaster to the traditions that create a tribe. When tribal members lose that identity from being surrounded by an alien environment they lose interest in living, and in regions where this loss of identity has occurred there has been a high suicide rate.

In recent years the decline in the number of medicine men has been directly related to the decline in Navaho income. Young people cannot afford the long and expensive training. In the Rough Rock region, where jobs have been particularly scarce, and the singer's traditions have remained in the heads of a few old men, it was important to have support for the training of new medicine men to maintain the mental health of the community.

Centered at the Rough Rock School, NIMH funds have enabled the beginnings of a new generation of singers. As in most schools, training is done in winter. During the summer when the children

are home and flocks must be tended, the trainees cannot leave home. During the winter when most of the ceremonies are performed (after the first frost) the trainees work with the medicine men for eight to ten hours at a stretch. The medicine man may live at some distance, and in winter the snowy or muddy roads become impassable, so that the trainee may be away from home for a long time.

A ceremonial may take three years to learn. It consists of hundreds of chants and prayers that must be learned by rote, and sung perfectly. A ceremony such as the Nightway, or Mountain Top Way may extend over nine nights and ten days. It is tantamount to learning a Wagner opera by watching performances, learning the libretto, score, staging, and costumes. In addition, the trainee acquires a knowledge of some 200 herbs, learning where they grow, how to gather them, how to prepare them, and administer them. Only a few of these are known to white men, and it is believed that the elaborate pharmacopoeia is all physiologically potent. Trips to collect herbs entail long treks into the mountains with the medicine man. They must also trap game and construct their paraphernalia.

When the medicine man is called to perform a ceremony, the trainees assist. Typically, the medicine man will begin the sand painting early in the morning, having spent the night chanting. The sand is smoothed on the floor of the hogan, and the medicine man deftly pours out lines of color between his forefinger and thumb. He shows his neophytes how to outline their figures. Kneeling and crouching, he outlines the intricate figure. His neophytes, with more obvious effort, imitate the forms in different colors. There is much laughter as the medicine man supervises, finding a mistake, correcting it. As they work for eight hours or so, they joke and talk about legends. Finally, the painting is finished. The medicine man walks around it finding minuscule details that have been omitted. Each dot has significance. He makes certain that it is perfect, without error. The remaining colored pigments, the charcoal, ground rock, pollen, are put back in paper bags. The patient will soon arrive.

A large flat stone is prepared with black, ochre, blue, and white powder, to which water is added.

Now the medicine man unrolls his bundle. He takes out some specially carved paddles and sticks with feathers, placing them around the huge sand painting. A herb is burned in the small stone fire by the doorway. At the eastern open end of the sand painting, an abalone shell is placed with some herbs mixed with water. A fur pelt is laid on the edge of the painting.

Now the patient, a sad young man arrives, and standing with the medicine man at the eastern edge of the painting he scatters corn pollen on it, blessing it. The young man strips down to his shorts, and sits against the north wall. The medicine man, chanting, takes a thumbful of blue pigment and presses it between the ribs just below the sternum. He utters a high pitched cry, calling the spirits. He presses a thumbful of white at the same position on the man's back. Now, as he chants, one of his trainees continues the painting of the proper symbols, like a four-colored necklace, over the man's chest, lightening designs down the arms and legs. The medicine man sings, shaking his rattle rhythmically. Occasionally he instructs or exchanges a word with the patient. There is laughter. The medicine man now takes a lock of the man's hair, placing a bead around it.

The medicine man raises the young patient to his feet, pulling him up as he grasps a prayer stick. The patient now sits on the edge of the painting, and its supernatural powers will enter into him. The neophytes rhythmically shake rattles and chant with the medicine man who now touches the man's body with his many prayer sticks, feathers, and sporadically offers him herbs to drink. The medicine man dons a garland of hemp and feather, and then places it on the patient. Occasionally he touches the patient with a prayer stick, making a chirping shrill sound, then chanting and praying.

Finally, he offers a prayer stick and draws the patient to his feet, and then sends him out of the hogan briefly while he erases the sand painting. A blanket is spread over the sand now and the basket is set on it, filled with corn meal. The patient returns and both sit on the blanket. As he chants, the medicine man feeds the patient herbs in water and corn. Finally, the medicine man takes some corn in his mouth, and the ceremony is over. The patient rises to dress. The trainees help the medicine man clear away the sand, gather up his paraphernalia. When they are ready to do this ceremony alone, they will first gather their herbs and collect the many necessities (such as sand from the sacred mountains) for their pouches. They will also carve prayer sticks, using lightning struck wood and special feathers. When they return with the medicine man to his hogan, they will spend more days learning the chants and legends, as well as the qualities and locations of herbs. They must memorize this perfectly, so that they can perform the ceremony flawlessly.

Each trainee, in addition to evaluation by his mentor, will be evaluated by Dr. Rosalie Howard, a psychologist, who will ascertain that the trainees do indeed learn white psychiatry and some internal medicine, that they are accepted by the community and

patients as well as mastering the rituals, herbs, sand paintings, and legends. In order to have some rationale for paying or not paying the medicine men and trainees, the director of the program, Mr. John Dick, has been making weekly checks on progress.

Although rituals are prescribed in every detail, each medicine man has a distinctive style. Longer ceremonies involve songs and prayers that may run to 1,000-5,000, or 50,000 words. Although these must be learned in the correct sequence, the ceremony has some flexibility, and a medicine man may alter the order of some chants. It is possible to learn one ceremony in a year. In a lifetime, even most learned singers rarely know more than several major chantways and a dozen minor chants. Of the 40-odd major chantways, and hundreds of songs, some already have passed out of knowledge. (The Feather Chant, the Knife Chant, and Lifeway Chant are no longer sung.) The chantways being taught at present are major ceremonies: The Big Star Way, Evil Way, The Holy Way, Red Ant Wax, The Mountain Top Way, Male Lightning Way, Beauty Way, The Game Way, and Tobacco Way.

The Beauty Way is perhaps the pivotal ceremony. A portion is performed protectively, before a Navaho G.I. leaves for Vietnam, before and after a Navaho undergoes surgery, against witchcraft, and in consecration of a house. The Holy Way and Blessing Way are sung over patients to give them good thoughts, good emotions, to make them prosper. They, too, counteract witchcraft and may even return an allergic patient to his normal self. In the confinement of the hogan a child commonly becomes restless, wandering off into the mountains. Legend indicates that such an affliction comes from the taint of the bear, and can be cured by the Mountain Top Way. The Big Star (which includes the Evil Way ceremony) can cure someone who has nightmares about death or the dead. Perhaps he saw a funeral, a dead body, or inadvertently walked over a grave, or wore the clothes of the deceased. In this ritual purification is important, and all take sweat baths and emetics that cause a vomiting up of the evil inside.

It would be a mistake to conceive of the medicine man training project only in terms of physical or psychiatric medicine. What is at stake is far more ramified. The enlightened men recreate the emergence, the identity of the people, and without these hatathli the tribal identity would decay. The rituals and legends that heal individuals are the rituals and legends that sustain the gentle tribe, giving security to the young and allowing the people to adapt to the universe into which they were born.

This program, if extended, may be in time able to perpetuate the complex Navaho culture. It could also be replicated with similar benefits elsewhere, in any community where traditional medi-

cine is still practiced. The impact far exceeds that of conventional scholarships to medical school, for in training medicine men, the leaders who emerge are far more than physical doctors. They are the leaders around whom swirl the community whenever there is trouble. This program is a community mental health program that effectively influences the mental health of the whole community—a rare project.

If the medical rituals of the Navaho people include elements resembling family therapy, or encounter marathons, the life style is similar to the goal of the human potentials movement. Group orientation, decision by consensus, and group sanctions without centralized authority are one alternative to the dominant culture of America in which egotism, competition and authority often generate strife. The current revival of interest in American Indian life may indicate that it is time to translate some of their precepts for the health of the white community.

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The Development of Intelligence in Babies

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For the past four years, Dr. Jerome S. Bruner has been concerned primarily with the cognitive development of babies: How does the human infant—so helpless and limited at birth—learn to control his environment and himself? How does he grow up intelligent?

Although human babies at first appear more stupid than chimpanzees of the same age, by the age of 2 or 3 the normal child has achieved one of the most difficult intellectual feats he may ever perform: he has reinvented the rules of grammar, all by himself, and he has learned to speak. He has also constructed a fairly complex mental model of the world, which allows him to manipulate various aspects of the world in his thoughts and fantasies. And he has learned to mobilize various skill patterns whenever he needs them. Under the guidance of Dr. Bruner, the Center for Cognitive Studies at Harvard is trying to unravel the sources of these formidable achievements.

There are various theories about how children acquire language. In his book, *Verbal Behavior* (1967), Dr. B. F. Skinner claimed that children learn to speak as a result of stimulus-response conditioning. All complicated behavior is learned, he argued; one learns to behave in ordered ways because there is order in the environment. Linguists such as Dr. Noam Chomsky disagreed, suggesting that human beings have an innate competence for language which sets them apart from all other creatures. This innate competence is what allows babies to learn language on the basis of relatively few encounters with words and sentences, they claimed, crediting babies—and mankind—with far more “mind” than most scientists were willing to accept at the time.

Innate Competence

Dr. Bruner and a number of other psychologists in the U.S. and abroad have now gone one step further than Chomsky in emphasizing the importance and activity of the infant's own nervous system. By studying babies well before they learn to speak, these researchers have come to the conclusion that language competence is just one example of an even more significant ability with which infants enter the world: the basic ability to pick up logical rules from mere fragments of evidence, and then use these rules in a variety of combinations. There are programs of action in the human mind right after birth, they believe, not only for language but also for the intelligent use of hands, eyes and tools.

"It's a very different view of man," says Dr. Bruner, "and it's just beginning. People are starting to see that skills of this wide-ranging type couldn't possibly be learned element by element. There must be some kind of predisposition in man to allow babies to pick up so quickly rules that go for such a large number of situations."

Only a few years ago, it was generally believed that newborns could not see more than the differences between light and dark; that during their first three months of life they were so absorbed by their insides that they could hardly react to the outside world; and consequently, that their physical environment had little impact on them—all that mattered was the provision of food and comfort. It now turns out, however, that even on the day of their birth, infants can track a triangle with their eyes. By the time they are 1 month old, they can spot the identity of objects and know when something has been changed. Furthermore, they actively invent rules of theories to explain what they perceive. Even at 3 weeks of age, an infant will have fairly complex hypotheses about the world he has just been born into—and if he is proved wrong, he may burst into tears.

That was exactly what happened at the Center two years ago, during an experiment conducted by a Radcliffe undergraduate, Shelley Rosenbloom. Researchers there wondered whether babies of 3 to 8 weeks really understood that a person's voice should come from the spot where the person stood—whether babies had the idea of a locus. If so, did these babies also grasp the fact that when the person moved, the sound of his voice should travel along the same path? To what extent had they organized their experience at that age? To find out, it was decided to use stereo speakers that could separate the sound of a voice from its origin. In response to ads in the Harvard Crimson, there is always a procession of babies—mostly the offspring of graduate students—to the Cen-

ter's lab, where they are made comfortable, given toys, and usually offered something interesting to see or do as part of a psychological experiment, while their mothers look on. This time, the infants were seated in front of a glass partition that separated them from their mothers, whom they could see just two feet away. As long as the speakers were balanced so that the mother's voice seemed to come directly from her, an infant would be quite content. But as soon as the phase relationship between the speakers was changed so that the voice seemed to come from a different spot, the baby would become agitated, look around, or cry—showing that his expectations were thwarted, and that there is powerful information-processing ability in the brains of infants even at that early age. "We now believe that infants have a notion not only of locus, but of path, right from the beginning," says Dr. Bruner. "Then, with experience, it becomes increasingly differentiated. But there is some notion of it right from the start."

The Study of Infancy

The Center's study of infancy has focused on five issues:

- 1) How the infant achieves voluntary control of behavior in a fashion governed by prediction and anticipation;
- 2) How visually guided and intelligent manipulative behavior emerges, with emphasis on the transferability and generativeness of skills;
- 3) How the infant progresses from being a "one-track" enterprise to being able to carry out several activities simultaneously and under the control of an over-rule;
- 4) How attention develops and its control shifts from external constraints (novelty) to internal constraints (problem-solving); and
- 5) How pre-linguistic codes develop, particularly in the interaction of the mother and infant.

("Our underlying assumption is that the codes of language, while they may indeed reflect innated patterns, are first primed by a great deal of interactive code-learning of a nonsyntactic type," writes Dr. Bruner. "When certain of these pre-linguistic manifestations are understood, perhaps light will be shed on the deeper question of the nature of language as such.")

In babies' hands, Dr. Bruner believes, lie clues to much of their later development, and he particularly wants to find out how babies learn the value of two-handedness. Nobody teaches infants this skill, just as nobody teaches them to talk. At around the age of 1, a baby will master the "two-handed obstacle box," a simple puzzle devised by the Center to study this process. Seated on his

mother's lap, he will suddenly use one hand to push and hold a transparent cover, while the other hand reaches inside the box for a toy.

To Dr. Bruner this is extraordinary, for it shows that the baby has learned to distinguish between the two kinds of grip—the power or “holding” grip, which stabilizes an object, and the precision or “operating” grip, which does the work. Monkeys and apes have developed a precision grip, Dr. Bruner says, but “it is not until one comes to man with his asymmetry that the power grip migrates to one hand (usually the left) and the precision to the other.” From then on, he emphasizes, many routines can be devised for holding an object with one hand while working it with the other, leading to the distinctively human use of tools and tool-making.

The experiments at the Center are essentially very simple, but their interpretations are not. Some of these interpretations parallel Noam Chomsky's “transformation” approach to linguistics, which reduces language to basic kernel sentences, each one made up of a noun phrase and a verb phrase. Early in childhood every human being learns the logical rules which allow him to transform these kernels into any possible sentence. Dr. Bruner speculates that when a baby learns to differentiate between the two kinds of manual grip, this foreshadows “the development of topic and comment in human language”—the basic sentence form of subject/predicate, which may be found in all languages, with no exception whatsoever, and which a baby expresses when he combines a holophrase (a single word or a very short phrase that is used as one word) with another word. Thus, man may be uniquely predisposed, at birth, to reinvent the rules of grammar, to process information, and to develop “clever hands.” He is born with a highly complex programming system, the result of millions of years of evolution.

What about disadvantaged children, then—why should they be different, if they are born with the same programming system? “Mind you, you can ruin a child's inheritance, too,” warns Dr. Bruner, “with an environment where he acquires helplessness. You can also be trained to be stupid.”

Before man's marvellous programming system can be activated for language, for instance, a baby must learn a series of primitive codes—and these require interaction with an adult. “What seems to get established very quickly between infant and parent is some sort of code of mutual expectancy,” says Dr. Bruner, “when the adult responds to an initiative on the part of the child, thus converting some feature of the child's spontaneous behavior into a signal.” Right from the start, parent and infant are busy commu-

nicating through eye-to-eye contact, smiles and sounds. As early as 4 months of age, an infant will smile more to a face that smiles back than to one that does not respond; and if the adult face then stops smiling back, the infant will look away. In some cases, he may even struggle bodily to look away. A child's other attempts at learning can similarly be brought to a halt when his expectancy is thwarted, and things stop making sense.

The Development of Strategies

The prolonged infancy of man has definite functional importance, Dr. Bruner concludes: During that time, the infant is basically developing the strategies that will later be combined for intelligent action—for thought and language, as well as for the manipulation of tools.

One such strategy is "place-holding." The earliest evidence of this can be seen in infants' sucking behavior. As everybody knows, a pacifier will calm a baby. But why? Earlier research had shown that sucking reduces hunger pangs and relieves muscle tension. "Well, by putting electrodes on the temples of babies as they were watching a movie here, we've begun to find out what a pacifier really does," says Dr. Bruner. "One of its principal effects is to cut down scanning eye movements, which cuts down the baby's information intake." At birth, and for a few days thereafter, babies can't cope with more than one activity at a time. When they wish to suck, they close their eyes tightly, to avoid taking in information from the outside. When their eyes are open, they stop sucking. By the age of 3 to 5 weeks, however, they can suck with their eyes open—but as soon as they become really interested in something, the sucking stops. Finally, between the ages of 2 and 4 months, a new strategy appears. Whenever something catches their attention while they are sucking, they stop their usual suctioning and shift to a sort of mouthing which keeps the nipple active, though at a reduced rate. This allows them to pick up where they left off with great ease, once their curiosity has been satisfied. A neat solution to an early problem, "place-holding," of this sort leads to many later skills, both manual and linguistic.

"As I got more into this work on skilled behavior, it became increasingly evident to what extent intention and hypothesis are central to the organization of knowledge and to the filtering of input," declares Dr. Bruner. In his most recent study, "Studies in the Growth of Manual Intelligence in Infancy," which he did with Karlen Lyons and Kenneth Kaye, Dr. Bruner emphasizes the importance of the infants' own programs of action. "When one observes the early behavior of infants—say at the onset of visually guided reaching at around 4 months of age—one is struck by the

fact that arousal of intention is the initial reaction to an 'appropriate' stimulus," he writes. "The earliest overt expression of activated intention is not 'trial and error,' but an awkward but recognizable instrumental act that expresses a preadapted program of action."

His movie, "The Intention to Take—The Infancy of Object Capture," illustrates how babies begin with an intention, act out its intended results (or an approximation thereof) and then work backward to the components that will in fact make such results possible. "First, they look at the object," says Dr. Bruner, describing the movie. "They want to take it. It's an intense gazing. Then, as the child's intention gets organized, his lips come forward in what we call an 'A-frame mouth.' Later on, when he take hold of the object, it will go into his mouth; but already, his whole system is activated, his mouth works. Then his arms come up in an anti-gravitational movement, and up comes that fist." The infants' actions are not yet in the right order for success. "Six weeks later, these actions will seem so well regulated that we'll forget the complexity of even so simple a task. Then they will leap forward to a fully orchestrated act. But the preparation is slow and demanding."

The infants' own intentions, then, are crucial. Of course, some goals can be imposed from outside, and babies can be taught, for instance, to respond to a buzzer in certain ways. Thus Dr. Hanus Papousek, a Czech psychologist who is now spending a year at the Center, has conditioned newborns to turn their heads sharply to the side at the sound of a buzzer, in order to get milk from a buzzer. "It can be done," says Dr. Bruner, "but it's endless. The babies show so much aversion to this. They're so slow at learning it, you have to present the stimulus hundreds of times,"

By contrast, when the infant uses his own initiative, learning often comes with lightning speed. In the Center's lab, a medium-sized room which might be called a baby theater, babies are placed in a well-padded seat facing a blank wall which serves as a screen. Then, with a pacifier in their mouth, they are shown a movie. "We didn't want to condition them to respond to a stimulus," Dr. Bruner explains. "Instead, we wanted to choose something the child does and give it some consequence. Then he is at the controls. So we chose sucking. Would they learn to suck at different speeds in order to produce changes in their environment? And, lo and behold, these little 4-, 5- and 6-week-old infants do learn to suck in longer bursts to produce a clear focus. Or else, if you reverse the conditions so that sucking blurs the picture, they learn to *desist* from sucking on this pacifier. They respond immediately, during the very first session, to changes produced by their own acts."

The movie that the babies watched so eagerly showed an Eskimo mother playing with her child. "It was shot in winter, indoors, and she was constantly involved in little games with him—string games and so on," explains Dr. Bruner. The experiment was devised by a graduate student, Mrs. Ilze Kalnins. When the babies discovered that sucking made the pictures clearer, they cut down their pauses between sucks, stopping only four seconds. On other visits to the lab, when they found that sucking blurred the image, they lengthened the pauses to about eight seconds.

The babies' performance was all the more remarkable because of their inexperience with "place-holding." To bring the picture into focus, they had to suck in longer bursts without looking at the film, then take a quick look before it blurred again.

Curiously, this experiment comes quite close to the kind of operant conditioning pioneered by Dr. Skinner, in which rewards are used to "shape" a child's activity. But Dr. Bruner interprets it quite differently, seeing the babies' rapid learning as the effect of fulfilling their own intentions. Sucking to produce a sharp focus involves quite complex strategies to coordinate looking and sucking. Such strategies come from the inside out, from an innate preadaptation, Dr. Bruner believes. Only after their appearance has been evoked by events can trial and error and reinforcements be of any use.

"What reinforcement is doing, in effect, is locking in that response in a set of alternative responses which in fact works," he writes. "It does not bring into being new responses. For the most part, the children do not *gradually* improve their strategies, but rather increase the skill with which they perform old routines. Two-handed efforts make their appearance abruptly, rather than by some gradual route, and seem to be 'ready' for triggering."

He points to an experiment performed at the Center two years ago with three groups of babies of different ages. The babies were seated in front of a table on which a jingly toy was placed behind a small transparent screen, open at one end. The youngest babies, only 7 months old, simply reached for the toy with the nearest hand and bumped into the screen. After banging on and clawing at the screen for a while, they lost interest and gave up. The next group, the 1-year-olds, began in the same fashion, but then let their hands follow the edge of the screen and reached behind it in a sort of backhand grasp until they got the toy. Only the 18-month-old babies knew right away how to reach the toy efficiently, and did so. Over 16 trials each, none of the babies ever changed his initial strategy; this was the best he was capable of at that stage.

"Trial and error implies the capacity to hold an end constant while varying means," notes Dr. Bruner. "The segments in which this is possible are very short in duration for the child. What thwarts him is distraction, not error." This is why he is so interested in the development of the child's own intentions, and in the kind of "planning control" described by the Russian psychologist, Dr. A. R. Luria, as being located in the frontal lobes. He hopes to study the development of strategies and plans in primates and compare it to that of human infants, so as to gain further insight into this issue.

Studies of Perception and Thinking

The Center for Cognitive Studies came into being in 1960. During its first years of operation, it paid no attention to babies. For Dr. Bruner, too, infant development is a comparatively recent interest. Unlike many other psychologists, who study the same topic for their entire working lives, he has ranged all over the field. And before calling attention to the cognitive growth of infants, he had helped to create interest in four major movements: 1) the so-called "New Look" in perception in the late forties and early fifties; 2) the study of cognitive processes, mostly in adults; 3) educational reform, with emphasis on new curricula; and 4) the study of children's cognitive development. Throughout, he always came back to the same basic questions: How do human beings gather, categorize, store, use and communicate knowledge?

"You can never get a direct test on reality," he says. "You must take scraps and test them against your mental model of the world." In his work on perception, he wanted to learn how people register information through the filter of their own experience. He concluded that the same objects—for example, coins—are perceived differently by different people, in accordance with their values and needs. "Perceptions are highly regulated entry ports," he notes. "An experienced eye will pick up so much more!" In contrast to work that considered perception to be strictly passive, this approach was called "hot" perception, or "the New Look" in perception. It led him to the boundary line between perception and thinking.

Together with other members of the Harvard Cognition Project, he then spent five years studying cognitive processes—"the means whereby organisms achieve, retain and transform information." At the time, this was a major departure from the accepted approach to psychological problems, behaviorism. For roughly 30 years, most positions of prestige in American psychology had gone

to people who studied stimuli and responses, by-passing anything that smacked of the "mental."

Spurred on by work in computer simulation and information theory, a few psychologists were beginning to worry about the mind again. Sometimes they called it "the black box." Clearly, the black box had to sort out all the inputs and outputs; but how did it do it? The behaviorists did not even attempt to answer this question, which they considered irrelevant. The members of the Harvard Cognition Project did, as described in Dr. Bruner's book, *A Study of Thinking* (1956). Specifically, they tried to deal with what Dr. Bruner called "one of the simplest and most ubiquitous phenomena of cognition: categorizing or conceptualizing. On closer inspection, it is not so simple. The spirit of the inquiry is descriptive. We have not sought 'explanation' in terms of learning theory, information theory, or personality theory. We have sought to describe and in a small measure to explain what happens when an intelligent human being seeks to sort the environment into significant classes of events so that he may end by treating discriminably different things as equivalents."

"There were some strategy theories I had picked up from John von Neumann," recalls Dr. Bruner. "I wanted to show how, in problem-solving, as in perception, people use strategy for choosing the instances they want to think about. I was arguing that strategy and systematic search efforts are characteristic of all living systems—that there are structures and hypotheses in the mind, and that you're constantly testing them against fragmentary evidence from the environment. You're locked—at the most tragic—you're locked into the structures that are species-specific to you, because that's the way the human nervous system is. But over and beyond that, there is a way in which, through the exercise of initiative on your part, you can turn on your own information, reorder it, and generate hypotheses. The structures in men's minds are productive, generative, just as grammar makes it possible for men to emit any number of utterances."

The Impact of Piaget

The emphasis on strategy in Bruner's work on perception and thought caught the interest of the famous Swiss psychologist, Dr. Jean Piaget. "It was the last thing he expected from an American psychologist," Dr. Bruner notes. "I guess I'm not a very typical American psychologist—at least my colleagues don't think so. I think I'm right in the tradition that started with William James, of pragmatism, and that they're very much in the tradition of Ivan Pavlov! You know—we don't have to look inside the organism, there's no structure at all, all the order is outside, and all

you do is mirror it.' Well, I take a drastically different view." Drs. Bruner and Piaget first met 16 years ago, when Dr. Piaget came to Boston to give a lecture. And Dr. Bruner was among the first Americans to appreciate the importance of Dr. Piaget's work.

Piaget's monumental studies of child development had been ignored in the U.S. for several decades, until the cognitive movement awakened to their value. In bold strokes, as well as painstaking detail, Piaget had described the growth of human intelligence, from the first day of life until adulthood. He had shown how children construct their own mental models of the world in successive stages, following an invariant sequence, though they may go through the stages at different rates. When a child has experienced enough conflict between reality and his image of it, he changes this image to make it more accurate. Thus, at first a child cannot understand that when water is poured out of a full glass into a wider glass which it fills only half way, the amount of water is unchanged. Being "centered" on only one aspect of reality at a time, he sees that the glass is half empty and says there is "less" water than before. Through a series of experiments, Piaget explored how children develop what he calls "conservation," the understanding that a quantity of water or clay will remain the same, regardless of the shape it takes. As children realize that objects and people have properties that do not depend on their immediate appearance, they become able to deal with symbols. Intelligence consists of such leaps into abstraction—but it depends on a large repertoire of images with which one can analyze certain sequences of cause and effect.

Dr. Bruner devotes considerable space to the contributions of "the Geneva school" in his book, *The Process of Education*. Many of his own papers show a strong Piagetian influence, particularly those in which he discusses the stages in cognitive growth. But eventually he developed differences of opinion with Piaget about how children acquire the notions of conservation and—much more fundamentally—about what produces intellectual growth.

"Mostly we argue about prefixedness," he says. "I found increasingly with Piaget that his notions of interior order were much more prefigured, prefixed than mine. I think this was the thing that caused something of an intellectual rift between us. I think that he misunderstands me more than I misunderstand him. He is too concerned with how the mind just processes things. I told him once, only half-jokingly, that his study of mollusks (conducted when he was only 15) was characteristic of him. His idea was that there was a mollusk, and no matter what that mollusk ate or what that mollusk did, it always turned out to have the

same prefigured shell. Piaget's notion of intellectual development is a bit too much like his early conception of the way in which a mollusk grows. As one of his colleagues pointed out when he was here a few weeks ago: What does Piaget need a theory of education for? Either the child hasn't reached the right stage, and there's no point in trying to teach him anything; or he has already reached that stage, and why bother to teach, as he'll learn anyway."

In Dr. Bruner's view, evolution has given man a wide range of possibilities—far wider than Piaget would allow—because man is a culture user, and his growth depends largely on the kinds of tools he uses. "I don't believe you can or should separate anthropology from psychology," he declares.

The Center for Cognitive Studies

By 1960, a number of converging trends made the study of cognition seem particularly promising. Some central place was needed to stimulate interdisciplinary research on the subject. With grants from the Carnegie Corporation of New York and other foundations, Dr. Bruner then founded the Center for Cognitive Studies, together with Dr. George A. Miller, a psychologist who was known for his work on psycholinguistics—the study of how cognition and language interact.

At first the Center focused on four areas: psycholinguistics, human memory, perception, and the cognitive growth of children. Among its many research fellows and visitors could be found psychologists, philosophers, physicians, linguists, anthropologists, sociologists and cyberneticists. Dr. Bruner was most involved in research on the cognitive growth of children, particularly those between the ages of 9 and 13. A Mobile Laboratory helped him and his associates to do experiments on the development of perception, attention, and judgment in children under controlled conditions, right next to the children's schools.

In the meantime, he had become famous in another field—education. This helped to make it respectable for psychologists to be concerned with the subject. His involvement began when he served as chairman of a conference of scientists, scholars, and educators at Woods Hole, Cape Cod, on better ways to teach science. His resulting report, *The Process of Education* (1960), was the clearest work on curriculum reform at the time, and won him instant fame. It has since been translated into 22 languages and is still being studied by teachers all over the world, particularly the ringing statement—which has been quoted over and over again—that "any subject can be taught effectively in some intellectually honest form to any child at any stage of development."

Although many of Dr. Bruner's ideas have changed since then, he stands by this famous statement, declaring that there is "absolutely no evidence against it." Another dominant theme persists: physics (or math, language, or any other subject) is not something that one "knows about," but something one "knows how to do." It is a way of thinking, rather than a series of facts. Thus, when Dr. Bruner devised a social studies curriculum for the fifth grade, "Man: A Course of Study," he gave 10-year-olds the raw materials with which to act like social scientists and three basic questions to start them off: What is human about human beings? How did they get that way? And how can they be made more so? The materials include films on the life cycle of the salmon, on free-ranging baboons, and on the Netsilik Eskimos, the purest surviving example of traditional Eskimo culture—the kind of authentic records previously available only to college or graduate students. The course has now been adopted by more than 1,500 schools. "Intellectual activity is the same whether at the frontiers of knowledge or in a third-grade classroom," Dr. Bruner wrote in *The Process of Education*. He still believes it passionately. And he is still involved in the creation of new curricula—right now, a new course for adolescents on principles of child development.

At the college level, he proposes a dual curriculum to take advantage of young people's drive to control their environment: On Mondays, Wednesdays and Fridays, students would continue with the essential basic course, such as mathematics or language, in which one step must be taken before another; and on Tuesdays and Thursdays, they would be let loose to govern their own learning in ways as experimental as possible. This would include taking part in budget decisions, teacher evaluation, and related matters—but more than that, it would mean that they could find their own problems to study. Preferably, these should be problems for which no answers yet exist.

Students are usually exposed to only two types of problems, Dr. Bruner points out: those which require analytical thought—e.g., dealing with abstract formulas—and those which require them to do some kind of laboratory exercise. "Both are formulated by the instructor or the text or the manual, and both are important in any science, art, or practical sphere," he says. "But neither is much like problem-finding. This requires the location of incompleteness, anomaly, trouble, inequity, contradiction. . . ."

The Growth Sciences

In the mid-sixties, as his studies on children's cognitive growth progressed, Dr. Bruner became increasingly dissatisfied with the age group he had been working with. "We were left with a sharp

sense of incompleteness concerning the origins of what we had studied," he noted. He saw that by the age of 3, a repertory of skills is already well developed. Therefore, he began studying younger and younger children.

By 1967, when Dr. George Miller left the Center, the transformation was complete: nearly all the Center's research dealt with the cognitive development of babies, including infants only a few weeks or a few months old. Traditionally, this age period had been neglected because the child seemed so inaccessible between his fifth day of life, when he left the maternity hospital, and his entry into nursery school at 3. Dr. Bruner urged his students to adopt the viewpoint of a naturalist exploring a new species, rather than try to test specific hypotheses derived from a general theory of infant development. "Assume that you are studying the great-chested Jabberwocky," he advised.

In this way, he took a lead in the development of what he calls "the growth sciences," a new composite discipline concentrating on the early years of life. "Just as medical research was organized around concepts of pathology, so today we would do well to organize our efforts anew around the concept of growth," he declared. "Those sciences that can help us understand and nurture human growth—biological, behavioral and social sciences alike—should find ways of joining forces as the growth sciences. Let them then make their knowledge relevant to those who are practitioners of the nurturing of growth: parents, teachers, counselors. It is bizarre that no such organization has yet emerged, though it is plainly on its way."

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Studies of Child Abuse and Infant Accidents

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Historically, the terrible toll taken by childhood illness and industrial accidents overshadowed the risk of children being injured by their parents. At one time children were believed to be in the grip of the devil because they had been conceived in sin, and harsh punishment was thought necessary to save them. Parents "owned" children and almost any punishment was considered legitimate. As our concepts of child development have become more sophisticated and our understanding of learning and discipline has advanced, harsh punishment has become less and less acceptable. Consequently the parent who beats his child is an object of censure. Today, we hold parents responsible for the well-being of children, and, therefore, the malnourished and medically neglected child becomes a subject of concern. Recognition that parents do abuse their children has grown, and hospitals and doctors are increasingly aware of the problem. Studies have been done to help define the problem and its dimensions, and to record the effects of abuse on children.

Children's Hospital of Pittsburgh is located in a large low-income district of the inner city and, like many other city hospitals, has an active emergency ward where many injured children are brought. Some of these children have multiple bone injuries. Early

in the 1960's the staff began to systematically study the possibility of abuse in these cases. A research team headed by Miss Elizabeth Elmer began, in 1962, a study of 50 families with children suffering from bone injuries who had been admitted to the hospital over the previous 13 years. This was a follow-up study to determine what happened to these children after their initial admission to the hospital. A second study followed which focused on infant accidents, and compared infants and families where accidental injury had occurred with those where neglect or abuse was present.

The problem of diagnosing abuse was attacked in the first study. Cases were selected for the follow-up study on the basis of their hospital admission record. Although abuse is a complicated subject involving both social and medical problems, the criterion of multiple bone injuries was selected for the purpose of a less controversial diagnosis. The family history was then examined and the families judged to be either abusive or nonabusive; those who could not be placed clearly in either group were considered unclassified.

The first study showed clearly that these children are in serious jeopardy, that many die and many become severely retarded and/or crippled and spend their lives in institutions. The first Study of Fifty Families resulted in an examination of what constitutes abuse. An examination of the "failure to thrive" child was begun and the role of accidental injuries noted. The second study focused on small babies not yet capable of getting into trouble on their own, thus illuminating the role of the parents in such accidents.

Both studies resulted in an examination of the theories and accepted ideas surrounding this issue. For instance, the working mother, commonly felt to contribute to child abuse, did not appear to be important. Neither were these children typically abused by extramarital partners or non-related figures; there was no "wicked stepmother" syndrome. While many parents were found to have serious emotional problems, few were mistreating the children for bizarre or extremely sadistic reasons. These children were rarely abused "coldly." Few of the parents were "bad" parents and total failures; most stayed with their families and eventually exhibited some success with their children. Neither did the parents typically injure all of their children. Abuse has been found to be a phenomenon related to the child-bearing period of the mother, and often the mother has been uninformed about contraception.

THE FIFTY FAMILY STUDY

A radiologist and a pediatrician selected 50 former patients for the study. Basic criteria included:

(1) Injured bones, revealed by x-ray film, indicating the occurrence of more than one traumatic episode, in conjunction with—

(2) Absence of clinical bone disease that might account for the condition.

(3) A history of assault or gross neglect, or the absence of a history showing convincingly that the injuries were accidental or attributable to an unusually traumatic delivery. A small group of children do suffer undiagnosed fractures at birth.

The final group was equally divided between male and female subjects, of whom 36 were white and 14 Negro. This racial distribution approximated that of the hospital's clientele. A number of the children had come to the hospital for other complaints, and bone injuries had been discovered in the course of routine examinations.

The majority of subjects had been young babies at the time of their admission. Seventeen were under 3 months of age when multiple injuries were found. Nine were between 3 and 9 months of age. This is in contrast to the curve for childhood accidents where the incidence rate for accidents is minimal below the age of 9 months. It then begins a sharp climb, reaching a peak between 2 and 3 years when it begins to level off.

Fewer than 50 families were actually interviewed—due to deaths, institutional placements, and refusals. Only families who still had their children were interviewed. Six families refused to cooperate. Thirty-one of the children in the original group, plus two siblings found to have bone injuries, added up to a total of 33 children studied and 31 mothers interviewed. Seven were foster mothers and one an adoptive mother. Essentially the families were told that the object of the study was to examine the hospital's treatment of patients, and an attempt was made to avoid focusing on the suspected episodes of abuse in order to minimize suspicion and distortion. It is of interest that the noncooperative parents were in general better educated than the rest of the group. They may have been more suspicious of the hospital's motives or more guilty about their own behavior.

Information was accumulated from hospital records, current examinations, home visits, and interviews with the mothers. It was initially anticipated that the fathers would not be available for interviews. Fathers were not interviewed formally, and it was

felt that potentially information from the fathers would have been of value.

Each of the children was given a current examination which included a complete pediatric evaluation, psychological testing, a psychiatric interview, a hearing test, and an x-ray survey of skull, long bones, chest, pelvis, and spine—with special attention to the sites of old bone injuries.

On the basis of all this information, the children were divided into three groups. Twenty-two were considered abused, four nonabused, and seven unclassified. Nonabused children were those whose early bone injuries had a plausible explanation other than assault by an adult. If agreement could not be reached as to the cause of the injury, the child was considered unclassified. For example, one such child had a record of birth injuries and a hospital admission at 3 months with fresh fractures, but no account could be obtained of abuse or accident. Unclassified families, then, while not labeled abusive cannot be considered nonabusive either.

Almost all of the families struggled to live on low incomes. Most had less than a high school education and correspondingly few job opportunities. In most cases the families had three or four children. About a quarter of the families in this study were on welfare; however, none of the nonabusive families were. The families lived in substandard, but not the worst, housing. Most lived in private dwellings or apartments, but none in trailers or rooming houses. Many of the families kept their homes in fairly good condition and the mothers tended to be good housekeepers. Physical squalor was not characteristic of this group.

The study families, particularly the abusive ones, suffered from marital stress. Many couples had been separated and reconciled many times without coming to any real resolution of their problems or differences. The abusive families tended to have more quarreling and drinking than the others. Several abusive mothers expressed fear of their husbands, and the investigators thought that in general their fear was well justified. One father, for instance, had a prison record for murder; another was observed to blow cigarette ashes in his baby's eyes and then to knock the child's head against a post. It is possible that mothers with poor self-control tend to be attracted to men with similar problems, or that the mothers want the fathers to appear in a bad light so as to appear sympathetic by comparison.

For disciplinary measures most of these families relied on physical means of control. Whipping and spanking were the most commonly used methods of discipline; scolding, withdrawal of privi-

leges, shaming, and shaking were also common. Reasoning with a child or avoidance of the conflict were methods almost never used. *These parents tended to see even small infants as needing discipline and as consciously and deliberately misbehaving.* It was rare for anyone other than the mother, or the mother and the father together, to discipline a child—and very unusual for the father to deal with the children by himself.

The nonabusive families tended to use a few types of punishments consistently, while some of the abusive families used a broad range of disciplinary measures that they were searching for some effective way to manage their children.

Mothers who abused their children felt very negatively toward the child who had been injured. It is not known if they felt this way about all their children or only the one who was abused. In one exceptional case, the mother expressed sympathy for the child who had been abused by her husband.

The abusive mothers appeared to have more emotional problems of greater severity than the nonabusive ones. Depression was common with about half of the abusive mothers troubled by difficulties in eating or sleeping and having a tendency toward crying spells. The nonabusive mothers, in general, had fewer and milder symptoms.

Several of the abusive mothers admitted to uncontrollable actions in the past—including physical aggression against other women; sexual promiscuity; and secret, compulsive spending. These mothers, who themselves had serious problems of control, admitted being afraid of their husbands as well. By their own reports, more of the abusive mothers than the nonabusive were easily irritated.

The abusive mothers were lonely people, often with no place to escape from the pressures of home and children. In many cases they had poor relationships with their own parents. There were no friends or relatives to help. It was noted that the mothers actively discouraged friendships, and did not join even relatively impersonal groups such as the PTA.

Child abuse is a family affair, however, and regardless of the identity of the abuser, the rest of the family participates. The other parent is involved by virtue of lack of interference or tacit approval. In many cases siblings may have injured the child, but again the responsibility must rest with the parents. The family dynamics are important in these situations.

The following case history illustrates the type of family problems that surround child abuse:

A 19-year old mother brought a three-month-old baby, her third, into the hospital. The baby was wearing a cast, and his weight including that of the cast was 10 pounds. He had had a birth weight of 5 pounds, 3 ounces. His x-ray showed that he had an old fracture of the skull, an injury to his shoulder, fracture of the left arm, multiple injuries to knees, ankles, and long bones of both legs. In addition, he had a bulging fontanel suggesting subdural hematoma.

The mother expressed her horror that every time she picked up the baby he appeared to have something else wrong with him. The child had been in another hospital at six weeks of age when he had been injured falling off a bed onto a concrete floor. When the emergency room doctor saw the baby, he wanted the police called as he thought it obvious that the child had been beaten. The baby needed two subdural taps at that time.

The mother's explanation was that she had put the baby in the middle of a double bed while she went to another room to wash his crib. A 14-month-old sibling was in the room with the baby. She heard a thump and thought toys had been dropped, and then ran to find the baby on the floor. She assumed that he had "scoted off" the bed. The father was critical of the mother for not watching the baby.

The mother had been a favorite child and had attended church faithfully. Her family had had ambitions for her to get a good education. At sixteen, however, she became pregnant and was disowned by her parents. The minister of her church was also very critical of her. The baby was born after a six-month gestation period and died after three days. During this crisis the mother was alone as none of her family came to see her. She married the father, and became pregnant again and had a little boy. When he was three months old, she became pregnant again and delivered the baby who was the patient. This added up to three births within 22 months. Two children had been premature. In addition, her parents separated and blamed their troubles upon her "disgrace."

The Children

Most of the children were quite young at the time of their first admission to the hospital. This study has shown that many children die or suffer grave and irreversible damage, but also that some children survive this early abuse, and reach a phase where their parents can successfully care for them and they can attain a reasonably good physical condition.

Eight of the 50 children had died by the time of this study. Most had been under five months of age at the time of death; two had

been slain by their mothers. Five children were in State institutions for the retarded. Many, who were in basically good health, had scars or deformities, but considering that they had been at the point of death and had suffered very serious injuries they were quite well recovered. One child was suffering from malnutrition, and several had organic brain defects. A large number of children were observed to show signs of upper motor neurone disease, as manifested by hyperactive tendon reflexes as well as abnormal plantar reflexes. A few children had signs of cranial nerve involvement manifested by strabismus and nystagmus. These signs appeared to be related to injury in all of the children born at full term, except in the case of one who was jaundiced at birth and had had convulsions prior to the injury.

In the premature children with signs of neurological damage, the effect of prematurity itself cannot be discounted. Only two of the prematures were known to have had head trauma and symptomatic convulsions. In one child, prematurity was the only known condition that could account for central nervous system damage. The abused children had twice the incidence of neurological signs as was true of the rest of the group.

The investigators found that two of the children had been injured in substitute homes. In one case the substitute home was arranged through an informal agreement between the natural and the foster parents, and in the other an adoption agency chose the home for an infant who was born out of wedlock. The latter child was subsequently moved to another foster home. In all, 11 children in the study were moved to substitute homes for their own protection, following the abusive incidents.

Birth

Histories were obtained from the mother, and other available sources such as hospital records. *It was found that about a third of the children weighed less than 5.5 pounds at birth, indicating prematurity.* As the national figure for prematurity is 8 percent, the percentage in this study is extraordinarily high. It is known that birth weight varies by race and by socioeconomic status. The national rates are 7 percent prematurity for whites and 12 percent for nonwhites. In this study, however, the higher percentages of low birth weight occurred among the white families: 8 of the 24 white and only 2 of the 8 Negro children had birth weights of less than 5.5 pounds. Although the significance of the large number of premature babies is not known, one possible explanation is that premature infants, because of their incomplete development at birth, are more vulnerable to bone injuries than full-term infants. A pediatric radiologist, Dr. John Caffey, is of the opinion that

there is more vulnerability in the first few weeks. The bones of a premature baby may be injured even with normal handling, for instance, during diapering. However, when chronological age plus the number of weeks of prematurity equals nine months, Dr. Caffey observes that vulnerability to bone injury becomes that of any full-term newborn.

The median age of the premature children in this study was 11 months at the time of hospital admission. This would indicate that their injuries were not due to immature bone development, but to other factors. Of the 21 abused children whose birth weight was known, seven were premature; none of the nonabused children were premature. It is known that premature babies are more difficult to care for than full-term ones; they may be more irritable and cry more due to their immature nervous systems. The mothers may be more apprehensive about picking them up because they are so tiny. In addition, the emergency situation that so often surrounds premature birth may be a serious strain on an already easily upset mother. Preparations for births are often incomplete when a premature baby arrives, and for a family with only marginal resources the strain can be severe.

Negroes, who often had extended families or else lived in overcrowded housing where other women were available, seemed to cope with the strains of prematurity better, with relatively fewer combinations of prematurity and abuse.

There is another issue, too, that must be considered: the more subtle problem of the mother's condition during pregnancy. A woman who is unhappy about herself, her marriage, her pregnancy, or her other children may take inadequate care of herself or be too overwhelmed to obtain help. In many cases these mothers may not even seek prenatal care.

Other questions arise: For instance, what causes one family to zealously protect, or even overprotect, a premature infant, and another family to abuse such an infant. Why, if a couple with abusive tendencies has other children, is the premature child selected for abuse?

Conditions at Time of Original Admission

At the time of admission to the hospital there was no difference between the chief complaints of the abused children and the others. The majority were brought to the hospital because of limitation of motion or pain in an extremity. The next most common complaint was convulsions, then "failure to thrive," and gastric symptoms. Convulsions and subdural hematomas, physical conditions that are often associated with brain damage, were diagnosed

in eight children upon admission. Surgical procedures connected with subdural hematomas were necessary in seven cases. Two other children required orthopedic surgery due to bone injuries. One-third of the group had previous hospital admissions.

Records of growth show that poor growth and abuse are not always associated. However, many of the children showed an improvement in appetite and growth while they were in the hospital.

Condition at Time of Study

Retardation

Forty-five percent of the entire study group had IQs under 80. Twelve of the 22 abused children and none of the nonabused children fell in this low IQ group. This is more striking when one realizes that this group does not include five of the original children who were placed in State institutions for the retarded. Only children still at home were included in the study. The investigators stress that they have no way of knowing what was cause and what was effect in this relationship between abuse and retardation. Neurological impairment is important in retardation, and many of these children showed such signs. In addition, many had histories of poor early growth, a condition thought to be associated with later mental retardation.

Speech problems, which are often associated with both emotional difficulties and mental retardation, were found in this study to be more closely related to mental retardation than to emotional problems.

Emotional Characteristics

The abused children had marked difficulty in impulse control as compared with others in the study. Many of the children, regardless of their classification, had poor self-concepts. Even the nonabused children had suffered serious injuries, pain, and traumatic experiences at an early age. Most had scars or physical deformities. It is not difficult to understand that they might view themselves poorly or feel inferior, especially if the parents had not been able to help them in a sensitive way.

Eight of the abused children had difficulty in controlling anger, and either had outbursts of rage or serious inhibition of negative feelings, manifested by very apathetic responses.

General Functioning

The abused children who remained in the same environments had a substantially greater number of problems than the nonabused children. Eight of these were retarded. The unclassified

children had more general problems than the abused children who had been moved to foster homes. Seven children, whose physical development had been poor at the time of hospital admission and who had been moved from the home, had achieved an average level by the time of the study. To emphasize the importance of the home environment, two children who remained in the same poor homes showed average development on admission but below average development at the time of the study.

Families at the Time of Abuse

The abusive families by and large lived in far more difficult circumstances than did the nonabusive families. However, all these families had often lived under stress, and for some reason abuse was not a constant process. Rather, it breaks out and then abates. In many cases, the sex or ordinal position of the abused child had a special significance for the abusive parent. One child was a second girl, as her mother had been, and both were family scapegoats. In another family, the two girls were severely abused by the mother, but never the boys.

The birth of a sibling less than one year before or nine months after the incident of abuse was found to be important. Nine of the abusive mothers were pregnant at the time of the abused child's hospital admission, one abusive mother had miscarried just before the child was admitted, and two others had borne an infant other than the patient during the year prior to admission. In only one of the other 11 families, unclassified and nonabusive taken together, was there an interval of less than one year between the injured child's admission and the birth of a sibling.

The investigators found that the connection between abuse and the burdens of pregnancy and child-rearing is clear and important. They cite the theories of Bibring, who identified pregnancy as a biologically determined maturational crisis that is not always resolved with the birth of the baby, but usually continues for some time, even in the most auspicious circumstances. The investigators point out that *these families abuse their children primarily during the child-bearing phase of marriage.* Later they appear to cope in a better fashion. *It was found that those families who had successfully begun to use contraception were able to recover from their previous strain and to stop venting their feelings of frustration and rage upon their children.*

Several of the mothers who were abusive were quite disturbed, and some were under psychiatric care. In three cases the fathers were clearly very disturbed or antisocial.

Substitute Care

A change in environment often saves the life of a child who has been assaulted. Still, some children were abused while in foster care. It was found that foster parents who voluntarily took children who were injured, neurotic, or retarded often had an unhealthy need to have children who were excessively dependent upon them. Furthermore, while much good can be accomplished, even the best foster or adoptive parents cannot undo irrevocable damage already done to the child.

Some foster children, due to their previous abuse, have severe difficulties even after the original crisis is resolved. These are troubled children and symptoms can appear long after the original trauma. In addition, the protective care so helpful in the beginning can cause rebellion later if the foster parents are unable to modify their methods in accordance with the changing developmental needs of the growing child. However, most of the children in placement showed marked improvement in their physical health.

INFANT ACCIDENT STUDY

The majority of the abused children in the Fifty Families Study had been brought to the hospital as accident victims even though their injuries were caused by assault. A few innocent parents of children suffering authentic accidents had unfortunately been suspected and sometimes accused of abuse. The masquerading of abuse as an accident and the reverse was possible because neither phenomenon was clearly understood. The investigators decided to study infant accidents, including abuse, to try to pinpoint the characteristics distinguishing one from the other.

Subjects were infants under 13 months of age who had been brought to Children's Hospital for x-ray following an impact accident or abusive incident. Since the younger the baby the more important the role of the caretaker, it was felt that this study would yield information about parental maltreatment and neglect, and not be complicated by the considerations of the normal accidents of the active toddler. One hundred and one children were seen, both inpatients and outpatients. Various issues were explored: for instance, the difference between families of abused or neglected children and those suffering accidents, with or without injury. The differences between retarded children who had been abused and retarded children who had not were also studied, with special attention to the mothering received by each group.

Abuse was suspected if the families' explanation of the injuries were not adequate, or if abuse was reported, or if more than one injury was present. Initial assessments were made of family

stress. Pregnancy and very small children were considered stressful. The family was considered to be under strain, too, if either parent had a close relationship with another adult who was unrelated to the child. This issue was considered and observed because of a number of mass media reports of abuse involving step-parents or paramours. As in the first study, this did not turn out to be an important issue.

The family was also considered under stress if the baby had developmental problems such as a significant deviation in growth, language, motor or social development, or such troubles as feeding difficulties or excessive crying.

All of these issues are important as parental reports are heavily influenced by anxiety, guilt, and concern when a child is brought to a hospital. An accurate report of the precipitating incident is hard to obtain. It is necessary to look at the entire family structure to find the clues that differentiate the abusive family. When abuse is suspected, deficiencies and deviance will usually be found in other aspects of family life. This study focused upon family structure, interpersonal relationships, and child care practices, in order to illuminate these differentiating issues. Because the children were so young, the mother was considered the principal caretaker and her interaction with the baby was carefully examined. In order to assess the mother-baby relationship, the pair were observed—and also the mother was interviewed and asked to fill out questionnaires. The observations were felt to be of particular importance, as the mother's habitual behavior with the child is likely to be beyond her awareness and ability to report. The observations provided data to supplement and correct the information gained through the other methods.

Many issues involved with mothering were examined in addition to the traditional ones of providing food, shelter, and medical attention. The stimulation given the baby, the verbal responsiveness, the quality of play, and the ability of the mother to assess the changing needs of the child were all considered. As in the previous study, a high number of retarded children in this group was noted and some important observations about their mothers were made.

Attempts to have an equal number of boys and girls, white and nonwhite, were unsuccessful as the potential subjects did not fall this way. Most of the children presented for x-ray were white females. Black female babies rarely appeared and, in addition, it was more difficult to enlist the cooperation of the nonwhite families in the research. All social classes were represented, but the majority of the families were in the lower classes.

Although a few families had refused to participate in the first study, the refusal rate was even higher in the second. It was suspected that the increased public awareness of child abuse and the outcry and pressure that had been building up made some parents less cooperative. Also, even parents of accidentally injured babies experience great guilt leading to unwillingness to discuss the event. In the Infant Accident Study, it was found very difficult to keep the allegedly abusive parents as subjects. They rarely refused outright to come to an appointment or to allow a home visit, but they failed to appear or were away from home at the specified time.

Neglect played an important role, and several families who could not be considered abusive were still considered deficient in their care of their children based on observations made during the study. Some parents, for instance, left their children without competent babysitters when they were absent for prolonged periods of time, or failed to obtain needed medical care despite repeated and careful instructions as to the needs of the child.

The final study group consisted of 100 cases, 78 of which were followed through all phases of the study and 22 in which families participated in the initial and final procedures, with only a mailed questionnaire in the interim. One of the mothers had two children in the study, making the total number of children included 101.

The methods included initial screening of x-rays, several home interviews with the mothers, and observations of the mothers in examination, feeding, and teaching situations. A questionnaire was mailed, and several pediatric and developmental evaluations were made. In several situations the mother was put under mild stress. In one instance, where she was asked to teach her baby to stack a series of blocks, the task was generally too advanced for the child so as to determine her reaction when frustrated by the baby. In another, she was asked to fill out a questionnaire when accompanied by the baby, to learn about her attitude when she was intent on another task. Four of the research persons saw each baby and family, and they were seen in as many situations as was practical.

The babies were evaluated twice in the first two years of life, a time of extremely rapid growth and development. This allowed for observations of the effect of the environment in a way not possible at later stages of life. Effects of poor parental care are obvious very soon during these early stages.

Of the 101 babies, brought to the hospital, only 10 were entirely without signs or symptoms. These 10 had been brought to the hospital for examination and reassurance, that despite a potentially injurious event, no injury had occurred. The other 91 babies

displayed a range of conditions from mild bruising to symptoms related to the central nervous system, such as momentary unconsciousness with or without vomiting, seizures, paralysis, and coma. The proportion of abused children without symptoms was roughly equal to the proportion of nonabused.

In addition to x-ray examinations of the site of the presumed injury, 21 x-ray surveys of the entire skeleton were performed. Ten of these were part of a diagnostic work-up for failure to thrive, the rest because multiple injuries were suspected. Eighty-two children had no evidence of fracture, 12 had a single recent fracture, and 7 had multiple fractures. The proportion of children with multiple fractures was much greater among the abused than the nonabused children. It was thought that if skeletal surveys had been universally performed, they might have disclosed other unsuspected, clinically unimportant fractures, which would have helped to evaluate the quality of child care. However, it is difficult to justify x-ray examinations without symptoms of injury.

Twenty-four children were judged to be abused, or to be both abused and neglected. Ten children were thought to be neglected only. There were 67 nonabused, non-neglected children. All initial judgments concerning abuse and nonabuse were reevaluated at the end of the one-year study.

The research was focused on the effect of abuse on the growing infant. The main areas of investigation included mental and motor development, behavioral characteristics, health status, and physical growth. The baby was seen as being affected by at least two kinds of factors—those that are relatively unchangeable, such as conditions at birth, and those that are influenced by the caretaker. It was hypothesized that the abusive group, in comparison to the nonabuse group, would show more stress, less support, and greater authoritarianism.

As required by State law, when abuse was found, reports were made to the Child Welfare Services and the parents were informed. Reports were made on eight children. A few other families were already known to the Child Welfare Services when they came into the study. In several cases, the mothers had named their husbands as the abuser and had separated from them. Two mothers overtly rejected the children whom they had mistreated, and the study personnel helped them arrange for placement away from home. The protective agency removed eight children from their own homes.

Because it is often observed that sick children are irritable and difficult to care for, it was noted whether or not the child had an acute illness at the time of admission. Eighteen of the babies were

sick with gastrointestinal and upper respiratory complaints when brought to the hospital. A few had anemia, and suffered other problems such as eye infections. By and large the babies were not suffering from infections, and the traumatic event was not related to the extra demands and needs of a sick child.

Twenty-four of the babies were admitted to the hospital, eleven of these for protection while further investigation of the family condition was carried out. Thirteen needed hospital medical-surgical care, some for incidental medical problems and some for injuries resulting from the accident or abuse.

The "failure to thrive" babies were studied from several standpoints. For some, metabolic and endocrine studies were done with inconclusive results. This condition, defined as occurring when a child has weight and height below the third percentile for his age and sex, is not well understood. Rarely are these children seen because of trauma; characteristically, the mother who brings them in is full of concern because a child has not reached the expected developmental landmarks. Often she is anxious because her child is not growing and will assert strongly that she feeds her baby well.

Home interviews in this study did substantiate that some of these mothers fed their babies adequately. Medical opinion is growing that this entity belongs with others where psychological phenomena and physical development interact pathologically, as in anorexia nervosa or infantile marasmus. Studies at Johns Hopkins Hospital have indicated that the problem lay in the hypothalamic area and that it was reversible without any hormonal or chemical treatment when the child was placed in a hospital, a relatively nurturing environment. It was postulated that emotional disturbance in these children may have had an adverse effect upon the release of the pituitary tropic hormone via the central nervous system. In the Infant Accident Study, "failure to thrive" babies whose environment was changed tended to achieve normal growth, but rarely normal development.

Initial Pediatric Evaluation

Upon initial evaluation, 54—or slightly over half the children—were found to have either no medical problems or only the insignificant ones expected during the first year of life. Two-thirds of the abused children, however, had serious health problems. Slightly fewer than half the babies had a number of actual and/or potential health problems including prematurity, moderate or high perinatal stress scores, significant medical problems, and histories of acute illness. Children in the abused group had a dispropor-

tionately greater number of health problems per child than the nonabused children.

The abused group was also distinguished initially from the non-abused by their poor physical growth. In part their retarded growth was probably due to prematurity (9 or 37 percent were premature by birth weight, gestation, or both), but even giving credit for weeks of prematurity did not bring them to normal level.

An estimate of how well the child was cared for in general was judged by the manner in which baby appointments and immunizations were attended to by the caretaker. Nineteen had not been seen regularly, if at all. Twenty-eight of the mothers had not kept their babies' immunization schedule up-to-date, and some babies had not received any immunizations at all. Most of the faulty child care was concentrated in the abused group. However, upon questioning it was found that 92 percent of all the mothers were able to recognize symptoms of poor health in their children and to find suitable medical services for them when they became ill.

Thirteen babies were considered poorly dressed, dirty, or ill-kempt when they were brought for their pediatric visit. The number of abused children in this category was much greater than the number of nonabused.

Accidents Versus Abuse—Initial Findings

Eighty-eight caretakers gave an accident history. *Twelve abused children were among those with credible accident histories, an overlap that illustrates the complexity of diagnosis in these cases.* Thirteen other children either had totally unexplained injuries or they were x-rayed because of suspected abuse, but no injuries were found; none of these had an accident history.

The assumption was made that adequate protection by the caretakers could completely abolish true accidents. The investigators realized, however, that this is unlikely and even undesirable, as a child reared in such a protective environment might have many other problems.

Three-fifths of the accidents were termed "active" because the baby's motor activity was an important contributing factor. Active accidents were subdivided into three categories: "open field" in which the babies propelled themselves into danger—for example, falling down the stairs when a gate had been left open; falls from appropriate furniture, such as couches or dressing tables; and falls from inappropriate furniture, such as the tops of washing machines—caused for instance, when a baby in an infant seat wiggles and the seat slides off the slippery top of the washing

machine. It was thought that most of the active accidents might have been prevented by the use of built-in safety devices, such as belts to confine babies on dressing tables.

Passive accidents were those in which the baby's contribution was minor and the responsibility of the caretaker greater. Subdivisions of passive accidents included babies dropped by their caretakers, those suffering "Act of God" events, such as being hit by a stray baseball, and those who were admittedly assaulted by another person.

The accidents were described, then the abused group was compared to the nonabused, non-neglected children who had suffered accidents. Points of comparison, in addition to general health and injuries already mentioned, were behavioral characteristics, age, and ordinal position. The families were compared as to social class, stress at the time of the incident, and health of the mothers.

The only infants who differed behaviorally were the babies who had active, open-field accidents. They were predominantly negative in mood, not distractible, and moderately or highly active. This combination of traits can be seen to result in babies who are difficult to protect from harm. By contrast, the other subjects, including the abused children, were positive in mood, easily distracted, and moderately active. The babies represented in the "open field" accidents were also the oldest (median age, 42 weeks) and, therefore, their motor development was more advanced.

Most of the babies in the accident group, active or passive, were only children in their families, while on the average the abused child was the second child. This suggests that parents of a first child are not as aware of potential hazards as they might be, and also indicates that in abuse cases—in addition to evaluation of the stress of having several small children—the possibility should be considered that one small child might injure another.

Ninety-two percent of the abusive parents were identified with Class V (low) according to the Hollingshead Two-Factor Index. Forty-eight percent of the nonabusive, nonneglectful families studied fell in this class.

Regardless of the type of injurious event, the mothers typically had special stress added to chronic factors of strain. The abusive mothers mentioned baby irritability generally and the other more often mentioned disrupted schedules, fatigue, etc. Over 50 percent of the mothers of abused children had significant health problems, for example, mental retardation, emotional difficulties, seizures, and heart disease. Such major health conditions were found in only 20 percent of the nonabusive mothers.

In attempting to determine the quality of the mother-child relationship, the investigators studied the caretaking process. This

process makes manifest much about the mother's interaction with the child and gives some measure of her general ability to function. The ability of the mother to monitor the environment for her helpless baby changes in relationship to many things. The mother, of course, operates within her own milieu and class structure, and this partially defines good mothering for her. The events that occur, the health and stability of the mother, the abilities she is potentially able to bring to bear to help her child, and her ability to perceive accurately his needs all affect her care of the child. Her degree of affection as well as her convictions about child rearing also enter in. Undoubtedly, too, the resources of the mother to provide support, affection, and aid for her are crucial.

Stress is seen as a major issue in child abuse, the caretaker being under insupportable stress in most such situations. In the case of the accidents, it has been noted that most of the mothers were reacting to stress in varying degrees—the abusive mothers, however, were under greater stress, had less support, and fewer personal resources. The interrelationship of stress, support, and the ability to cope can be seen as a continuum.

It must be remembered that the early years of child rearing are heavily demanding. Little money is available, and many young people are unprepared to become parents. Shifts occur in families even when children are desired and planned for, and greater strain is felt with unwanted babies. The investigators view most young families as being at a point of lowest tolerance for stress at a time when they are subjected to the highest stress during the years when children are being born. However, it must be realized that what constitutes stress for one individual can be handled by another. Unfortunately, some types of chronic stress are brought on by poverty, which rarely permits growth or learning and usually undermines a family's ability to function. The investigators were most interested in everyday stress, as opposed to extraordinary or emergency stress, because they felt that chronic stress was of key importance in child abuse.

The demographic data about the abusive families was a documentation of the degree of chronic stress. Almost half the abused children were black, and most of the combined abuse and neglect occurred among the black families. Because of the larger numbers of children with comparatively few fathers in these homes, the families fall into a group known to be especially vulnerable to many kinds of stress. According to socioeconomic status, all the families in the combined abuse and neglect group are classified in the two lowest classes of the Hollingshead scale of social position.

There were ten families that were considered neglectful but not

abusive, and it was found that in some ways they resembled both the abusive and nonabusive families.

The nine families demonstrating abuse but not neglect were predominantly lower class, with two members of the middle and upper classes; the ten families showing neglect alone included four classes from Class I, the highest of Hollingshead's classifications. One of these families was classified as neglectful because they habitually left the baby in the company of an active 30-month old sibling without adult supervision. Another family was called neglectful because their child was encouraged to perform physical feats distinctly beyond his limited ability, such as hanging from the pantry shelf by his fingers.

An assessment was made of the medical condition of the child and the mother's reaction to it. It was found that of the ten "neglect only" mothers, eight showed only slight reactions to medical problems. The mothers of the abused children reported feeling great stress due to their babies' medical conditions. The focus of these mothers on their babies' health was seen by the investigators as being realistic in view of the extremely poor health of these children.

There was one group of 24 women, primarily made up of black mothers, who were unusually bland or under-reacting to medical problems in both themselves and their children. One such mother had noted an abnormality in her baby's eye for more than a week, but hadn't sought medical advice about it. The investigators had several ideas, but no definite answers to explain this attitude. A middle-class mother, they believe, tends to emphasize her attentiveness to her child whether or not it is warranted. This is not always the case with the lower socioeconomic class mother. The investigators also note that many of the "upper reactors" were poorly educated and suggest that perhaps they did not really understand the potential hazard of some of the conditions. However, seven of the "under reactors" belonged to middle- and upper-class groups and were well-educated. An analysis of the "under reactors" by social class showed no significant class association. It is also suggested that the apparent apathy may be a defense against implied criticism and intrusion by the outsider or a way of coping with what would otherwise be overwhelming anxiety. It may also indicate a true indifference or a general state of apathy which includes, but is not limited to, the child.

The type of stimulus perceived as stressful and the reaction to it are highly individualized matters. To avoid imposing any preconceived hierarchy of stress, the investigators inquired what had happened to the mothers or their families since conception for the index child. The events divided naturally into Hill's four categor-

ies: physical difficulties, separations from persons or possessions, accession events such as a new person moving into the house, and social disgrace. The mothers' reactions were dichotomized as 1) mild or non-existent, or 2) strong. The number of stress events and associated reactions were combined to yield a total score for each individual. Mothers in each group were ranked and the groups compared.

In general, recent events were given highest stress ratings by the mothers. Acute conditions were reported as more stressful than chronic ones, and events involving the immediate family as more stressful than those involving extended family or friends. The proportion of mothers reporting no stress whatsoever was greater among the neglectful than the nondeviant, and only 4 percent of the abusive reported no stress.

Accidents, moves, and physical illness were the greatest sources of stress for the abusive mothers; also, prominent among the accidents were attacks upon the mothers by others. Several women reported having been beaten by their husbands. One abusive mother claimed to have been raped on her way to the hospital with her baby. Although the report seemed questionable, it was similar to others in its preoccupation with violence, either factual or fantasized.

A common source of stress for the abusive and other families was a change of residence. Typically the family moved during the woman's pregnancy to obtain more room. In both the abusive and nondeviant groups, the moves in late months of pregnancy resulted in strain on the mothers and at times brought on premature deliveries.

Illness was often reported and sometimes—especially in the group of abusive mothers—reported not as chronic conditions, but related to pregnancy for the index child. The abusive mothers felt very strained by the pregnancy of the child in question and ranked pregnancy as a higher stress even than deaths.

According to the physician's rankings of physical disorders associated with pregnancy, the abusive mothers who reported the most stress actually had the least, thus indicating a higher psychological sensitivity. Six of the abusive mothers who reported difficult pregnancies were caring for other young babies when they were pregnant and, also, had fewer people available to help them.

Potential support factors included a satisfactory male relationship: the presence of a man in the house—whether spouse, common-law partner, or father; a continuous association with a male during pregnancy; help from the man in relation to the baby; a stable source of income; a continuous source of medical care; participation in religious activities and involvement with neigh-

borhood activities. The abusive families and the others differed significantly in the amount of support available. The abusive families had the least support.

Statistically significant factors were continuous association with the father during pregnancy and help from a male—whether husband, father, or friend—in relation to the baby. The current presence of a male in the home on a stable basis did not appear to be a significant positive factor; nor was marital stress a significant negative factor. During pregnancy the help of the father appeared to be mainly psychological, but once the baby arrived the mother received more support when some male did something concrete to assist in the care of the baby.

The effects of race on stress and support were assessed. When support was low, black mothers reported significantly more medical stress than white mothers; they suffered more physical problems than the whites. The white mothers, however, reported significantly more social stress when support was low. This comparison would seem to reflect the perception of the woman, white or black, as she viewed herself in relation to her peer group.

The mothers were scored for general negative and positive reactions to their babies, and several trends appeared. The abusive mothers tended toward extreme reactions, judging the babies to be either all good or all bad, while the non-abusive parents saw their children more realistically as both pleasing and annoying. The abusive mothers were relatively silent with regard to their children's development. Fifteen of the 19 abused children showed early signs of retardation.

Modes of Punishment, Discipline, and Teaching

It was predicted that the abusive mothers would use harsher methods of punishment and would have less interest in teaching their children than the other mothers. The results were not so clear cut.

Forty-one percent of all the mothers used some form of physical punishment with babies less than 6 months old, usually slapping the hands or the buttocks. At 9 months, physical punishment intensified. By 24 months, 87 percent of all the mothers were using this method of physical punishment at least part of the time.

The type of behavior punished varied with social class. Mothers in the two highest classes punished principally for aggressive acts; middle-class mothers for activity, dangerous or otherwise; and lower-class mothers, for conduct such as excessive demands, disobedience, or crying. Generally the abusive mothers, most of whom were lower class, punished for unacceptable conduct. Across

all groups, girls were consistently punished earlier: by the age of 9 months, 31 percent of the girls, but only 5 percent of the boys were being punished; by 18 months, the figures rose to 70 percent and 50 percent for the girls and boys, respectively.

The investigators had become aware that most mothers are extremely sensitive to their babies' aggressive acts against them as mothers. When asked how they would respond if their infants struck them or spat upon them, the overwhelming majority of the mothers of babies 6 months of age or older said they would retaliate in kind, ". . . to show him that he is *not* to do that kind of thing." Three mothers of babies who were less than 6 months of age also said the same. Eighty percent of the abusive and 63 percent of the nondeviant mothers said they would hit back against infant aggression.

Regardless of their social class, most mothers asserted that a baby should know right from wrong by the age of 12 months, and one-third of the mothers specified 6 months. This belief implies a common lack of realistic information about infant development and when babies learn concepts of right and wrong. These mothers also perceived the babies as having "tempers" and other directed feelings at a much younger age than is actually possible.

The mothers involved in this study usually discriminated very little between discipline and teaching. When asked how they would attempt to teach the baby some new behavior representing a real learning effort for him, they most frequently responded in terms of scolding or spanking to get him to learn after first giving verbal instructions. The investigators feel that infants are punished physically more often than is realized. When it is common practice to strike babies, however lightly, with the goal of teaching them, the laws of probability indicate that some babies are going to be struck too hard and that some will be injured.

Values Related to Mothering

The mothers were questioned as to their expectations concerning the child. The majority preferred their babies to be "good"; that is, respectful, grateful, obedient, and not rebellious. These were the particular goals of the abusive and neglectful mothers; they were not interested in creativity, etc.

There were varied opinions among them as to what constituted an "ideal mother." All the abusive and the neglectful mothers mentioned keeping the baby clean and giving him material things. A few mentioned the importance of being a "proper" woman. They described the ideal woman in negative terms as somebody who does not run around or sit *z. oars*. The abusive group often described the ideal father in terms of discipline or financial sup-

port. Several women said that the ideal father should not beat the mother.

Quite a few mothers felt that affection should be restrained: that there is danger in being too affectionate toward babies. This trait was more marked in the abusive and the neglectful mothers.

The index of values related to mothering clearly and significantly distinguished between the abusive and the nonabusive groups, correctly classifying 77 percent of all the families. Among the abusive mothers, emphasis was placed on cleanliness and materialistic values. They tended to perceive themselves and their husbands in stereotyped roles, a perception suggesting difficulties in forming and maintaining close relationships. Their fear of showing too much affection toward their babies was another manifestation of the same difficulty. These characteristics, together with the common need to have an obedient, compliant baby, established the abusive mothers as more authoritarian than the nonabusive women.

The Baby

The contribution of the baby to the mother-child relationship is extremely important. A smiling baby who is responsive may keep even a detached mother involved. While many types of behavior are important, it was decided that four behavioral characteristics would be examined: mood, level of activity, approach or the way the baby related to a new person or new object, and distractibility. These characteristics were studied during the initial and the final pediatric examinations.

Among all the children the distribution of positive and negative mood showed a decided difference according to sex and developmental age. Regardless of their developmental age, half the boys were positive, half negative. The girls were strikingly negative when developmentally young but became positive as they matured. Abused boys were markedly negative compared to their nonabused peers. Abused girls were more positive than nonabused girls; however, the abused females as a group were developmentally older than the nonabused.

Eight abused children, four boys and four girls, were separated from their parents by the time of the second testing. All were predominantly negative in mood. According to the study data, this seemed associated less with their removal from home and more with the mood to be expected from the above findings. The four negative boys were similar in mood to the majority of abused males, while three of the negative girls were developmentally young and thus apt to be more negative.

The factors of sex, age, and abuse which affect predominant mood need considerably more study before the interrelationships

will become clear. Nevertheless, these findings suggest that boys and girls may indeed respond to abuse in quite different ways.

It was not possible to find associations between mental development and behavioral patterns. Some of the children were advanced developmentally, some at age level, and some retarded. Some in each group were positive in mood and could be distracted.

Distractibility depends upon whether or not a child can be intrigued away from something he is doing, especially if it is a hazardous activity. In this case, it is a positive quality, as opposed to hyperactive distractibility which interferes with concentrated learning.

All of the babies who were positive in mood and distractibility were positive in approach; that is, interested or curious or pleased at meeting new people and new things. Among the nonabused children who had negative or mixed scores on mood and distractibility, a racial difference occurred on the approach scores. The whites of both sexes were predominantly positive in approach, while the blacks of both sexes were predominantly negative. The investigators noted that the examining doctor was a white woman and wondered if this could be a factor influencing these results.

Activity levels did not distinguish between abused and nonabused children. The babies who were both abused and neglected were low in approach and play behavior and high in negative activity. The "abused only" or "neglect only" had wider repertoires of behavior. However, of the "neglected-only" children, a large proportion either remained high or became high in activity. It was observed that the mothers were largely ineffectual in controlling their children; they tended to pile on command-after-command while the children became more anxious, active, and difficult. The ability of these mothers to limit the activity of their children, who seemed to be in special need of help in controlling or directing their activities, seemed very meager.

Observations of Interaction

The mothers were observed with their babies during a feeding period at home and in a teaching situation in the pediatrician's office. It was learned that mothers vary considerably in their perceptions of what is dangerous to their babies. While the mothers were in the doctor's office, the babies were often attracted to the doctor's kit containing instruments. Most mothers did not permit their children to handle these, yet failed to see the danger in the sharp corner of a drawer that the children loved to pull out. The examining table was also a danger, as mothers often turned away while their babies who were lying on it waited to be dressed.

The actions of each baby and mother were tallied and analyzed according to content, mode, and context. Mothers of retarded children concentrated on feeding them and behaved more positively toward the child as the baby ate. They did not talk spontaneously to the child as much as the mothers of non-retarded children. The investigators believed that this reflected the mother's concern that the child eat rather than play or socialize. There was an overwhelming tendency for mothers of retarded *abused* children to show low verbal response to the babies' vocalizations, but an opposite trend was shown by mothers of retarded *nonabused* children. The age of the baby was not a factor in the mother's tendency to verbalize when the baby made sounds. Some babies responded to their mothers' speech, others did not, and again this was not related to baby age.

It is probable that an involved mother gives her baby many types of stimulation in addition to the verbal. The verbal response, however, seems to be a good indicator of the total social environment provided for the baby. Mothers with a good education were much more verbally responsive than those with a poor education.

A significant association appeared between mothers who responded verbally and the higher rates of development among these babies. The investigators note that such an association has not previously been reported but they point to several conditions that may affect it. The children of well-educated, intelligent mothers may have superior genetic endowment. Also, babies who have had a great deal of verbal experience do better on tests, which often require ability to follow verbal instructions.

With regard to control, the abusive mothers tended to give their children great latitude until their patience wore thin, when they would abruptly threaten or strike their children. The neglectful mother seemed to burden the child with repetitive commands and threats to which he paid little attention, apparently sensing that the mother did not know how to control him, or for some reason was unable to do so. As he became more active, the mother became more frenetic.

The abusive and neglectful mothers tended to care for the babies, but made neither broader responses nor extra reactions to their children. They tended toward stereotyped responses.

The teaching situation, which was essentially an artificial one, aroused some anxiety. However, the observers of the feeding, who knew the mothers, thought that they behaved much the same as they had in the past. This was substantiated by the significant positive correlations between the feeding and teaching observations with respect to maternal-verbal responses among all cases; mothers of nonretarded children; high social class; and females.

Final Evaluation of the Babies

The most important final difference between the abused and the nonabused babies appeared in the scores on the Bayley Mental Scales. There was significantly more retardation among the abused children when compared with the nonabused. The likelihood of retarded mental development among the abused children was greatly increased when they were also judged to be neglected by their parents. The fairly high rate of mental retardation found in all groups of children in this study may mean that the hospital outpatient population is biased in this direction.

The final checkups showed little difference in height and weight increases between the abused and nonabused children. However, this was true largely because one-third of the abused children had been removed from their homes and placed in benign and nurturing homes. All but one showed remarkable catch-up growth. There was a significant association between height and mental development ratings, with retarded mental development occurring more frequently among children below the 10th percentile in height.

In terms of family characteristics, the single factor most strongly related to the mental development ratings was the amount of income per person in the household. The percentage of children within the retarded, normal, and advanced groups coming from families with less than \$100 a month per person was 74 percent, 46 percent, and 7 percent respectively. Although abused children more often come from families with low incomes, the relationship between income and mental development was not altered significantly when controlled for the occurrence of abuse. When children with retarded and normal development were combined, 79 percent of the abused and 52 percent of the nonabused children came from low-income families; this represents a statistically significant difference.

Among those with advanced development, the majority of the children were white; among those with slow development, the majority were black.

Although stress was found important, no statistical association between ratings of social stress and ratings of mental development appeared. However, the number of supportive resources for the mother was related to mental development. Among the families of retarded abused children, 69 percent were low in support while only 31 percent of the families of nonabused retarded children had similar low ratings. When stress hits a family with few sources of support and assistance, then the problems become more intense.

The presence of the father is also important. The group who were advanced mentally all had their fathers at home, while only

59 percent of the retarded had fathers living with them. The father was absent in the cases of 64 percent of the retarded children who were abused.

Regarding the probability of retardation, three factors in addition to abuse are important: low monthly income per person, significant physical problems in the baby, and low verbal responsiveness in the mother. When any two of these factors plus abuse was present, 100 percent of the children were retarded. Among children without any of these factors, only 21 percent were retarded.

The second evaluations showed that, remarkably enough, there are children who appear normal despite abuse, and it is also evident that there is a range of intensity in abuse. Some children are subjected to pervasive and long-standing abuse, while for others the abusive incident is isolated in an otherwise favorable environment. *The investigators caution that an overall characterization of the abused child demands both pediatric and family assessment. The physical and mental effects of abuse can be mimicked by other conditions, and also the physical and mental state may not fully expose the abusive atmosphere of the home.*

Diagnosis of Abuse

A crucial factor in the diagnosis of abuse is the willingness of the physician to consider abuse as a possible cause of a child's injuries and to examine him accordingly. Dr. Grace Gregg, a pediatrician and an investigator in this study, points out that a diagnosis of abuse requires a history that fails to explain the injury, the elimination of systemic disease, and an assessment of the type of care that would allow such a condition to develop. "Failure to thrive" children must be looked at with an eye to abuse and neglect. It is important where there are multiple injuries that each be accounted for. Multiple bone injuries are considered a key indication of abusive treatment. It must be remembered, however, that some bone changes do not show up immediately on x-ray and may be hidden until about 12 to 14 days. Furthermore, x-ray can tell the condition of the bones, but not how they were injured nor the motivation of the person responsible for the injury. In some cases a parent can roughly and abruptly grab a child to prevent an injury and accidentally hurt him. However, while this type of accident can happen once, a series of such incidents would be highly suspicious. Also, the idea that siblings can injure infants is unpopular, but must be considered.

Malnutrition is a key indication of abuse or neglect, but evidence of malnutrition is difficult to identify when intake becomes adequate, unless photographs are taken.

Familiarity with the normal injuries of children is indispensable to adequate diagnosis. Superficial injuries above the elbows, shins, and knees that do not resemble dermatologic conditions should be examined to see if they have been caused by rough handling, human bites, cigarette burns, etc. All bones and joints should be examined, not merely those pointed out as injured.

Legal Issues

By June 1967, 52 child abuse reporting laws were in existence in all 50 States, the Virgin Islands, and the District of Columbia. Puerto Rico added a law soon thereafter. In most cases mandatory reporting by medical personnel, occasionally by schools or social workers, and investigation by law enforcement agencies was typical. In some states the professional can be fined or imprisoned if he fails to report a case of child abuse.

At first glance it looks as though the situation has been acknowledged and adequately covered. However, this is far from the case. The Children's Bureau looks upon child abuse reporting laws as case-finding devices. How successful they are for this purpose is difficult to assess. Some problems have, however, been identified. For instance, diagnostic guidelines are not well-drawn. There is the possibility of an inappropriate accusation, perhaps a law suit. Medical training is often limited in terms of teaching the type of social-family assessment that is required in many child abuse cases. This type of case can be tremendously time-consuming and time is a rare commodity in most medical practice.

Another problem is that of confidentiality. The child abuse laws place the child's right to safety above the traditional rights of the patient—in this case, the parent—to protected communications. A social class difference may slant the manner in which a case is treated. For example, in many States hospitals and physicians are required to report a case if an abused child is brought for care. Private doctors, however, are not exposed to the same public attention and might—and do—manage private patients differently. A doctor who reports a patient stands to gain ill-will and lose the family for treatment. He may feel he can give more help by not reporting the case and staying involved as an interested and concerned family doctor. Patients who can afford private care can also “shop” around. They can go to different physicians and the full extent of the child's history of trauma might be hidden in this way.

The goal is not, it must be remembered, merely full reporting. The goal is the protection of the child. The two are related, but not the same.

The investigators feel that professionals who report a family in good faith should be granted immunity in the event of a law suit. Other changes should allow for concern for the other children in the family.

The lack of community placements for such endangered children also make some people reluctant to confront an abusive parent, as it is realized that all too often the child must return home with an even more enraged and abusive parent.

There is considerable question as well, as to whether or not the police should be given responsibility for establishing whether abuse has occurred. In many cases this type of approach with the goal of proving guilt and establishing criminal behavior is unfruitful. As this research has shown, the problem may be subtle; a child may have been left with inadequate supervision or the parent may have shown poor ability to anticipate the child's pattern of activity. The caretakers may be extremely immature or disturbed, and thus cannot be considered directly responsible for injury to the child. Nonetheless the child may be in great jeopardy. But it is questionable whether most police have the orientation, time, or training to investigate these issues.

Prevention is largely ignored, as is appropriate follow-up and assistance to families in need of community aid. Expanded protective services are much to be desired. Assistance with related problems such as contraception should also be available.

Punishment of the parents or probation, which often means only the most minimal surveillance, rarely accomplishes much toward the most important goal—protection of the child. Punishment for doctors or hospitals may very well be self-defeating and discourage reporting. The most fruitful approach is via education. Physicians need to be sensitized to the issues and hospital procedures need to be changed so as to permit early identification of the endangered child. Referrals to social agencies should be facilitated and child care resources developed. Where a murder or brutal attack has taken place, then the police are appropriate; where an overwhelmed mother has a child who continually injures himself due to lack of supervision, another resource such as the help of a trained homemaker might be more appropriate.

Prevention of Child Abuse

To save a child from the serious effects and irremedial damage caused by abuse and neglect, it is necessary to recognize the situation when it occurs. Professionals need to be alert when they notice that young families are having their children too quickly, with no relief between pregnancies. The danger signs of marital strain, poverty, isolation, and overwhelmed mothers need to be

heeded. Premature births with indications of family strain should be of great concern; all possible assistance and surveillance should be given these parents. Parents with children showing developmental difficulties should be given similar help.

It is important that education be restructured so that every young woman has some idea how children grow and develop. Classes should be held early in school, possibly at the elementary and junior high level, ensuring that all prospective mothers will be at least basically informed and, if possible, have supervised experience with child care. It cannot be too strongly stressed that far too many women think a young baby is responsible for his acts and can react intellectually like an adult. The whole concept of physical punishment for infants requires re-thinking in the light of knowledge about child development. Again, it must be realized that, despite ideas that physical punishment is a lower-class phenomenon, this practice was found in all classes. And males must be taught the importance of their contribution to the stability of the family and the emotional life of the child.

Education in family planning should be made available if we are to prevent parents from becoming so overwhelmed that they destroy their own children. Appropriate birth control methods should be made easily available. Unwanted children are in grave danger of abuse and all its long-term residual damages.

Education of legal personnel, especially that of judges, is necessary. The investigators note that even in cases which represented blatant abuse as manifested by multiple skeletal trauma with central nervous system damage, when they petitioned for removal of the child from the home the authorities were more concerned about the rights of the parents than the welfare of the babies. Some children were returned to the custody of their parents after their fractures had healed and their general condition improved without any assessment of the family at all. The courts do not seem to be truly aware of the risk to the child—that it might not merely be a question of a single meaningless act, but that abuse may constitute an active expression of a wish to be rid of the child. The overwhelming odds against complete recovery from parental abuse seem to escape appropriate attention. The horror of many situations and the intense feelings they arouse may cause some people to try and mend the parent-child relationship in order to wish the whole situation away. It is not always true that the natural parent is best for the child, nor is it true that any parent is better than none. Parents, on the other hand, need not be treated as criminals because they have abused their children. A total assessment of the entire situation and its pressures needs to be made.

One issue, that of community support, demands special attention. As family patterns change and mobility increases, social institutions such as the church lose their strong hold on family life. People who tend to be isolated become even more so. It is probably true that many parents who do not beat their children would also benefit if a neighbor could help them out when they are overwhelmed, or if a network of friendly visitors would somehow fill this void. Volunteers could be used to extend the work of the public health nurses and the hospital clinics to ensure that both mild supervision and help would be available to young mothers. Homemaker services can be extremely important. Community programs and neighborhood associations could also be helpful if the prohibition about interfering or getting involved could somehow be broken down constructively. It is possible that an auxiliary to the police department could be useful.

The interrelationship of poverty, isolation, and too many unplanned-for small children is important. Too often, little is done to reach the very people who are too weak to ask for help. Newspapers and TV, too, often carry only the sensational story and not the steady compilation of data that might enable us to make reforms in our welfare systems, our birth control clinics, hospital regulations, courts, and foster home programs—data that might enable us to prevent such tragedies and save these children.

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A Community Mental Health Center in Appalachia

Executive Director: RICHARD M. STAI, M.S.W.
Mountain Mental Health Services, Inc.
Prestonsburg, Kentucky

Predecessor Project: Social Worker-Nurse Clinical Team
in Eastern Kentucky

Investigators: LOGAN GRAGG, M.D.*
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Though a number of urban community mental health centers have been reported upon in these volumes, the chapter which follows is the first to deal with a rural center. The report is unusually detailed because it is an effort to depict the circumstances, such as vast service areas and severe shortages of professional mental health personnel, that are common among rural centers, to suggest some of the other problems and vexations of these centers, and to show how one well-regarded center is coping with all these.

INTRODUCTION AND SUMMARY

Mountain Mental Health Services, a private, non-profit community mental health center in eastern Kentucky, has an unusual catchment area. Though it takes in only 160,000 people and thus is smaller than average, it covers five whole counties spread over a sizeable chunk of the Cumberlands. Roughly rectangular in shape, it measures about 55 miles one way and 65 the other as the crow flies and two or three times more as a car goes.

Scenically, this section of Appalachia is among the country's richest; economically, one of the very poorest. Most of the land runs up and down, and most of the people live in narrow valleys

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carved by the Big Sandy River and its tributaries or in isolated "hollows" between hills. The soft coal mines, the largest source of jobs, have for years been needing fewer and fewer men. Unemployment runs double the national average. One of the five counties ranks as the poorest in the Nation: another, as the third poorest. More than half of the families have annual incomes of less than \$3,000.

Until recent years, there was not a psychiatrist in the entire five-county area, not a clinical psychologist, not a psychiatric nurse. The nearest mental hospital, Eastern State, where hundreds of the area's residents were or had been patients, was five hours away in Lexington over rugged mountain roads.

As compared to urban centers, Mountain Mental Health Services, whose headquarters are at Prestonsburg, is unusual in other respects:

- It operates five full-time centers—one in each county—and one weekly and two monthly outposts.
- It is headed by a psychiatric social worker—Richard M. Stai, the executive director—and has social workers or psychologists in all but one of its other key positions.
- With only one psychiatrist on the staff, serving two days a week at the present, it depends heavily for medical services on the five general practitioners who serve as part-time consultants.
- Pending completion of an inpatient facility, it makes some use of general hospitals but depends mainly on Eastern State to care for patients who need to be hospitalized more than a day or two. Jails are still the main holding facility.
- It combats budgetary limitations and the shortage of professional manpower by recruiting young adults, having at least two years of college, as "mental health workers." These are expected through on-the-job training to function much as psychiatric social workers. They include former teachers, former employees of the State's welfare program, a veteran of Vietnam, and a former nun.
- Since a large proportion of the people it serves are poor, a substantial part of its income is derived from welfare funds and from Medicaid.

As discussed in a later section, this rural mental health center stems from another unusual venture financed by the National Institute of Mental Health. This was a demonstration project to test the idea that State hospital admissions from the mountain counties would be markedly reduced if a two-man clinical team—a psychiatric social worker and a psychiatric nurse—were stationed in the area.

The new agency has seen troubles. In the beginning, in 1967, it had to scratch for working space, and three years later its outpatient clinics and day-care centers were quartered in a variety of unlikely places, including a former automobile showroom in Prestonsburg; a long-vacant suite of offices—cleaned up, repaired, and painted by staff members over a period of many months—next to Gertrude's Beauty Salon on the second floor of Prestonsburg's Odd Fellows Building (the staff takes its kidding on that one); the cellar of Heritage House, headquarters of the Pikeville Woman's Club; and the cinderblock Weeksbury Community Clubhouse, along a creek running through a coal company town that has been abandoned by the company but not the residents. In the beginning, the center also had to overcome the suspicions of the medical profession. "The doctors hardly ever referred a patient to us," a staff member recalls, "but now they send a good many."

Life undoubtedly will be a struggle for at least a few more years. But the center's staff now includes, in addition to the psychiatrist and medical consultants, four psychiatric social workers, three psychologists with master's degrees, two psychiatric nurses, nine mental health workers, a child guidance counselor, an alcoholism program coordinator and several assistants; a mental retardation program director and assistant, and a part-time pastoral counselor.

During its third year, ending in June, 1970, the agency gave some form of service to more than 2,400 people. It had started life with a caseload of 400, inherited from the demonstration project. Late in 1970 it had a caseload of 866. Of these, 725 were outpatients, 104 were in partial hospitalization, or day care, and 37 were inpatients—all but two or three of them at Eastern State (which can now be reached, over a new highway, in two and a half hours). Considering that until eight years ago the only mental health service in the whole region was a monthly aftercare clinic for former State hospital patients—"a pill clinic," as Stai describes it—these figures in themselves are remarkable. As can be inferred from the size of the staff in relation to that of the caseload, the mental health center itself has had to depend mainly on "pill clinics" for helping the bulk of its patients. But its activities, let alone its plans, reach far beyond.

Last year's budget was \$380,000. Expansion of services, already under way, is expected to more than triple the budget—bringing it to about \$1.2 million—possibly by 1972.

Except for the statistics on patients, there is no "scientific" basis for evaluating the work of Mountain Mental Health Services. Possibly there will be in the near future. Each month for three years the center—along with other Kentucky mental health

agencies and institutions—has been feeding statistics into a record-keeping and comparison-making computer program operated by the State department of mental health, but the computer has yet to deliver an accurate report. When it does, Executive Director Stai (rhymes with “sigh”) thinks he will be able to say, for example, how many patients from his unusual catchment area went to Eastern State last year, and how long they stayed, and whether or not they returned—as compared both to the year before and to pre-agency years. Meanwhile he estimates that the agency’s programs have reduced by more than half—probably by almost three-fourths—the *proportion* of mentally ill persons who must go to the State hospital. He suspects that the *number* may have somewhat increased because the center’s activities have led to greatly improved case-finding.

Stai is reasonably sure that the readmission rate, too, has been substantially reduced. Pamela Brewer, the psychiatric nurse who runs the center’s day care program in Pikeville, throws light on the significance of such a reduction. She is talking about a day-care patient who has been in Eastern State several times. “Each time she comes back,” says Mrs. Brewer, “she is a little older and a little more worn. She has a little less strength, and she’s more ready to give up every time she comes back from the hospital.”

The following sections give a brief account of this rural mental health center’s predecessor; discuss the center’s structure and staff; describe special programs; report a discussion of the Eastern Kentucky Syndrome, the center’s most difficult clinical problem; picture activities at several of the center’s units; and consider finances.

Patients’ names, and some details of case histories, have been changed.

A PIONEERING CLINICAL TEAM

The story of Mountain Mental Health Services begins in 1962 when Hazel G. Price, director of social services at Eastern State Hospital, Lexington, proposed establishing a demonstration team to serve four eastern Kentucky mountain counties: Pike, Floyd, Martin, and Johnson. For half a dozen years the hospital had been sending a psychiatrist and a social worker to Pikeville, the largest city in the area and the seat of the largest county, to hold a clinic for ex-patients two days a month. Still there were a disheartening number of readmissions, and Mrs. Price was working with some families over and over again. She felt that a resident team consisting of a psychiatric social worker and a psychiatric nurse could deal more effectively with the problems of patients who had left the hospital, could screen out and get local care for many patients

who ordinarily would have been sent to the hospital, and might well arouse the region's interest in developing its own mental health facility. Logan Gragg, Jr., M.D., superintendent of the hospital, agreed. The plan they developed won NIMH support of approximately \$25,000 a year for four years and went into operation in 1964.

Members of the team were Hart Ransdell, a Kentuckian with a master's degree from the Tulane University School of Social Work, who had worked with Mrs. Price at the hospital, and Tressa Roche, who had come to the region from Florida and had a master's in psychiatric nursing from the University of Miami. Avanelle Swiney, a young Pikeville woman, was secretary and receptionist. The team's offices, known as the mental health clinic, were several rent-free rooms in the basement of the Pike County Health Department building, an old brick structure located between the county jail and a parking lot.

Efforts at the start were centered on former patients. Through letters, phone calls, and home visits, Ransdell and Mrs. Roche tried to get and stay in touch with those the hospital considered especially likely to need after-care. The aim was to prevent crises that might lead to re-hospitalization. The team members worked by offering immediate counsel to former patients and their families, enlisting community resources in their behalf, and encouraging attendance at the monthly clinic still being given in Pikeville by staff people from Eastern State Hospital, assisted now by the project team. Appointments for this clinic in July of the first year numbered 150; six months later, 227. As word spread that professional mental health personnel were available, more and more of the patients were persons who had never been hospitalized. Eventually these constituted about 50 percent of the total.

The team found that sometimes patients without money were being sent to Eastern State even though the primary need was for physical care. For example, a patient who refused surgery for a broken hip was committed to the mental hospital. One day a woman who'd had a stroke was brought by ambulance to the health department. The health officer's first impression was that she needed psychiatric care in Eastern State. The mental health clinic's nurse took the patient's blood pressure and persuaded the officer that she would benefit from care in a general hospital.

Members of the project sometimes achieved results simply by the application of common sense. One elderly man's family, for example, worried because he was forever leaving the yard, wandering down the road, and getting lost. The family asked for help in having him committed to the State hospital. Instead of helping in that respect, Ransdell suggested that the family build a fence

around the yard. They did, and the old man remained contentedly at home.

Demonstration staff members are particularly proud of their work with persons arrested for drunkenness. Ransdell and Mrs. Roche, through their acquaintance with the jailer and his wife, would get a jailed alcoholic to the county health department for tranquilizers and then talk with him, often repeatedly, in the jailer's quarters. Eventually the jailer and his wife took the initiative in handling all such cases. A number of the alcoholics reached in this way stayed dry. One of them, who had often been carried to the jail in an ambulance, won election to the State legislature.

Eight months after the work began, one of the investigators wrote:

The most significant development since the team started is the involvement of local individuals in the handling and treatment of psychiatric cases. In the past, almost everyone from the circuit judge to the private physician only dealt with a "mental case" when there was an acute emergency and then always took the line of least resistance. It was not unusual for a disturbed person to spend a week or more in the local jail waiting to be committed and transported to the hospital. The local physicians found it very difficult to involve themselves in these cases. However, now that the community has professional mental health leadership, most of the doctors are quite willing to give their time and service.

Travel required an extraordinary amount of time. When even four home visits could be made before sundown, it was a good day. Some homes deep in the hollows could be reached only in a four-wheel drive car donated by the Appalachian Foundation, in Berea, Kentucky, which has given two more such cars to Mountain Mental Health Services. There was so much to do in Pike County, which accounted for half of the region both in area and in population, that team members rarely visited the other three counties. The team did schedule patients from the entire region for the Pikeville clinic and during the second year began holding monthly clinics in each of the other three counties. At these clinics the county health officer, a general practitioner, served as the medical consultant. During the second year, team members saw more than 625 different patients and conducted more than 2,500 interviews.

The results were almost startling. After two years, the rate of readmissions to the State hospital from the four counties had dropped 67 percent and the first-admission rate from Pike County, where the team members lived and did most of their work, 40 percent.

Another outcome was even more important. During the second year of the project, the Mountain Mental Health Association, lim-

ited to Pike County, was formed, and membership reached 500. This made the association the largest of its kind in the State. Mrs. Swiney, the demonstration team's secretary, recalls going out with Ransdell and Mrs. Roche and selling memberships in the banks and on the streets. Mrs. Lon B. Rogers, one of the first leaders of the region's mental health movement and president of the board that operates the present center, recalls selling memberships in bowling alleys.

The movement to organize a mental health association grew out of a series of 6:30 o'clock breakfast meetings that were organized by the late Eugene Lopez, administrator of Pikeville's hospital, and attended by 15 civic club leaders. The aim was to win State and Federal help for the establishment of a permanent mental health facility in Pikeville, and a strong local mental health association was seen as a means to that end. Members of the demonstration team served the group both as advisors and as fellow workers.

As the Kentucky State mental health centers plan developed, it became apparent that Pike County could get a permanent facility only by working with four other counties—the three listed earlier as part of the region covered by the demonstration project, plus Magoffin. These mountain counties always had been energetic rivals. They cooperated this time, however, because many persons in every county knew or had heard of someone who had benefitted from the services of the demonstration project and because members of the demonstration project went beyond the call of duty to serve as mental health missionaries as well as mental health workers.

A regional mental health board to organize and operate a five-county center was set up during the project's third year. It had three representatives from each county, chosen by each county's mental health association. The associations in the other counties had been organized with the help of the Pike County group. Late in 1966 the board hired Stai, a friend and Tulane classmate of Ransdell's, to be executive director of the new center, which came into being the following year.

Of the persons responsible for the success of the demonstration project, Dr. Gragg is now a staff psychiatrist at the Veterans Administration Hospital, Lexington; Mrs. Price is on the staff of the Kent School of Social Work, University of Louisville; Ransdell has gone into business in Atlanta; Mrs. Roche became director of nursing at Kentucky State Hospital, Danville, Kentucky, in 1966, and her successor, Patricia Smith, is a nurse at the Appalachian Regional Hospital, South Williamston, Kentucky. Mrs. Swiney is medical records librarian for the new center.

STRUCTURE AND GENERAL SERVICES

Stai's first problem was where he was going to work. Pikeville had wanted the agency to have its headquarters there and had expected that they would be there. In fact, stationery had been made up with Pikeville as the address. But the other four counties that the State had made part of Region 11 threatened to withdraw. The State department of mental health had forced a compromise under which headquarters would be in Prestonsburg, 35 miles away. When Stai arrived, however, arrangements for office space were still under way, so he accepted an offer of space in Pikeville's hospital. His phone soon was busy with protests. He did some phoning himself, and within three days the Prestonsburg mayor and the Floyd County judge had found him an office in the Floyd County health department in Prestonsburg. This is a town of 4,700 whose shopping center and lovely residential areas are bypassed by the road giving access to it, Route 23.

Today, a visitor to the headquarters of Mountain Mental Health Services finds himself in front of a building, on Route 23, that looks like an automobile showroom. Indeed, a sign in the lot at the lower end says "Parking for Toyota Customers." But Toyota has moved, and in its former showroom, screened from the road by Venetian blinds, the early-morning visitor finds men shooting pool. One of the players says that this is the day-care center, and that the agency's headquarters are upstairs, reached by a separate outside door at the building's north end. The second floor, it turns out, is a former apartment whose living room, dining area, and kitchen have been thrown together for the office staff and the bedrooms remodelled for the administrative staff.

Looking over the agency's table of organization, the visitor is struck by these facts:

- It includes only one psychiatrist, who is the medical director.
- The psychiatrist comes under a social worker, the executive director.
- The psychiatrist is flanked by two other social workers, who function as assistant executive directors. They are designated as coordinators. The clinical coordinator is T. M. Atkinson, a native of Georgia, who got his master's in social work from Kent School of Social Work, University of Louisville, in 1967, and was hired by the new agency the same year to be the social worker member of its Pike County team. In his present job, Atkinson serves as liaison between the executive director on the one hand, and the various clinical programs on the other. The community and administrative coordinator is John E. Mason, a graduate of the Kent School of Social Work, who recently returned to Kentucky after 20

years as a social worker in the Midwest. Much of his work is concerned with public education, discussed in a later section.

Isn't it unusual to have a nonpsychiatrist at the head of a community mental health center?

"Not in Kentucky," Stai answers. "There are seven or eight non-M.D. directors. That's about half."

During its first three years the agency had a succession of full-time psychiatrists serving as medical directors. The first left to take a better paying position with another mental health center. The second, Dr. James Bland, left to become deputy commissioner of medical services in the Kentucky State department of mental health. The third left in the spring of 1970 because he wanted to work in a hospital setting. On loan from the State, Dr. Bland now serves the center part time.

"It probably would be easier to recruit a psychiatrist if he were offered the position of executive director," Stai says. "But the more we thought about it—we being the board of directors—the more we thought we could get that job done cheaper and just as effectively with someone other than an M.D. as the director. For instance, my time is almost entirely tied up with administrative functions—recruitment, personnel, the business end of it, grantsmanship. And it sure costs a lot less to pay me to do that than it would an M.D. With only 25,000 psychiatrists around the country, we figure that they might as well be used for what they are trained to do."

In sum, Mountain Mental Health Services thinks it is making the wisest use of a scarce resource. Its psychiatrist is briefed on most of the new patients and meets many of them. He prescribes the treatment, advises members of the mental health area teams, and is available for consultation, by telephone, even on those days he is outside the region. He sees not more than two or three patients on a regular basis. Dr. Bland has been spending one of his two days a week in Pikeville and getting to the other counties several times a month.

Five other M.D.'s—general practitioners—are on the center's staff as medical consultants, one in each county. They are available to write refill prescriptions, to order changes in medication—often at the suggestion of some other member of the staff—when the psychiatrist isn't available, and to help handle emergencies.

Services Through Area Teams

When Stai accepted the job, he thought it might be possible to follow approximately the urban model of a mental health center. The agency's resources would be centered at one or two locations,

and distant areas would be served by periodic clinics. But as he traveled through the region and talked with members of the demonstration project, he decided that the urban model would have to be disregarded. Any approach to adequate service demanded the establishment of fairly autonomous area teams, each of them a miniature mental health center trying to meet through its own resources and those of headquarters all or most of the basic elements of service required for NIMH support.

There are now three such teams. Each offers round-the-clock emergency service, through its own office on weekdays and through the Prestonsburg General Hospital at other times. (A nurse at the hospital takes calls for the center and gets in touch with a member of the agency's staff.) Each provides consultation to doctors and other professional people who ask for it and offers educational services—newspaper stories, radio reports, talks to groups—generally through members of the headquarters staff. Each area team also provides inpatient service, either through one of the region's four general hospitals that are affiliated with the agency or through Eastern State. In theory each affiliated hospital has several beds for mental patients, but for lack of psychiatrists and psychiatric nurses these are infrequently used, and never for more than a few days. Most patients requiring day-and-night hospitalization still go to Eastern State, admittance to which may be made by any professional—social worker, psychologist, nurse, psychiatrist—on the agency's staff.

Through an NIMH grant, the new wing of the Methodist Hospital in Pikeville, which is under construction, will provide 20-some beds for psychiatric patients and will become the principal inpatient facility for all three area mental health teams.

Area Team I has its headquarters and inpatient clinic in the Odd Fellows Building, Prestonsburg, two doors down the street from the Prestonsburg General Hospital, and about a mile from the former Toyota building, where the central staff and the day-care center are housed. Team Director is Richard Gallaher, who has his master's in psychology and plans to begin work soon for his Ph.D. The day-care center is under the supervision of James Klein, a former Roman Catholic priest with five years of experience in his Chicago parish counseling young people, alcoholics, and former mental patients. He is listed as a social worker. Other members of the team include four mental health workers, who serve both the clinic and the day-care center, an aid, and a receptionist.

Team I also conducts a clinic every Monday at the Appalachian Regional Hospital in McDowell, about 25 miles to the southwest. It is staffed by Gallaher and a mental health worker and attended by

15 or 20 patients. Every Tuesday, Klein and a mental health worker conduct a combination clinic and day-care center at Weeksbury, about 35 miles to the south; these are reported upon in a later section. And every Friday, the team director and an assistant travel to the out-of-the-way Mud Creek area, about 30 miles to the southeast, and see perhaps a dozen patients—out of the 35 or 40 in that area—in one of their homes or in a store and make a few home visits if time permits.

Area Team II is located 35 miles south of Prestonsburg—in Pikeville. Its headquarters and clinic are in the Methodist Hospital; its day-care center, in the basement of the Woman's Club building, half a mile away. Team Director is Dale Stanton, a Kentuckian who came to Mountain Mental Health Services in 1969 shortly after receiving his master's degree in psychology from Murray State University, Kentucky. The day-care supervisor is Pamela Brewer, R.N. Other members of the team are a social worker, a guidance counselor, three mental health workers, an aide, and two receptionists.

Team II also conducts a monthly clinic in the Appalachian Regional Hospital at South Williamson, 30 miles northeast, on the West Virginia border. Out of 50 patients in that area, about half are scheduled to come in on a particular day.

Area Team III is located 15 miles north of Prestonsburg—in Paintsville, a mainly residential community of 3,100 people and seat of Johnson County. This team is responsible for Johnson and two neighboring counties, Magoffin and Martin. Headquarters are a one-story, five-room house in downtown Paintsville. The director is Roger Marshall, a Johnson County native who recently received his master's degree in psychology from Morehead State University, Kentucky. He is assisted at headquarters by another young psychologist, a psychiatric nurse, and a receptionist.

Team III also maintains a full-time office in Salyersville, a town of 2,000 about 20 miles to the west, staffed by a young mental health worker with three years of college and some teaching experience. Quarters are a suite of four rooms in a new medical building. The team also has a one-room office in the Martin County health building in Inez, a crossroads town of 600 people, 25 miles to the east of the area's headquarters. The mental health worker stationed there resigned recently to take a better-paying job. Until a successor is found, the staff psychologist comes up from Paintsville for a few hours a day. Normally, he and the team director each spend one full day a week in Inez and another in Salyersville.

The mental health worker in Salyersville or Inez cannot handle every problem that comes along. But agency officials point out that

he is as near as the telephone to his team director in Paintsville, and the team director can get in touch quickly with the clinical coordinator or some other person in the central office. Each of Team III's mental health stations has a medical consultant.

Mental Health Workers: Backgrounds and Roles

If receptionists are omitted, half of the positions on the area teams are filled by mental health workers. Almost all of these grew up in the region and have had experience either in social service agencies or as teachers. One is a political science major who decided he wanted to work with people. Another majored in psychology and was serving in Vietnam as an Army social worker when the center opened. One woman on Team I has a master's in English; another, the wife of the team's day-care supervisor, was formerly a nun. Two women on Team II used to be with the Public Assistance Office; they have been with the center almost since its start and are considered among the most valuable members of its staff.

The minimum educational requirements is two years of college. Mental health workers with a degree start at \$6,000; the others, \$5,000. These salaries used to be competitive, Stai reports, but now are below those offered by other agencies.

Mental health workers are used both as intake interviewers and as supportive therapists. In the latter roles they are assigned to patients judged likely to benefit from having someone who will listen to them and help them meet—with the aid of medical, welfare, and other community services—their most pressing problems. They are generally assigned to the older, more chronic patients, but, in Stai's words, are used "in the whole gamut of mental health center tasks except diagnostic testing, writing prescriptions, and helping patients develop insight—and several of the more experienced ones do that, too."

Stai believes that with certain kinds of patients the center's mental health workers can be at least as successful as more highly trained people from outside the region. "Anybody who is really interested in helping," he says, "can be trained to be as helpful with a limited population as a psychiatrist or a psychologist."

To Atkinson, the clinical coordinator, a principal difference between professionally-trained and nonprofessionally-trained workers lies in their ability to make diagnoses and prognoses and to set reasonable goals for treatment. The center takes this difference into consideration by having team directors work with other staff members to develop plans of treatment and understand what goals can be expected. Team directors also try to match the abilities and

background of a particular worker with the needs of a particular patient.

On-the-Job Training

Each area team holds weekly meetings, during which the members discuss new patients and the team director offers guidance both on specific cases and general mental health procedures. The team director also meets with the other members individually. Once a month the agency holds a "regional staffing" in Prestonsburg, the headquarters city, borrowing for the occasion the Sunday School room of the Presbyterian Church.

The program attempts to improve the performance of the entire staff. It opens at 9 a.m. with a warm-up period, the responsibility for which goes to a different team each month. "Many of our people are almost strangers to one another," Stai says, "so we try to have some kind of activity that loosens people up and gets them comfortable with one another. It may range from a silly game to a songfest." Last time, somebody brought five pumpkins. The staff, except the psychologists, was divided into five teams, and each team spent 15 minutes carving its pumpkin according to some diagnostic category. Then it was up to the psychologists to diagnose the pumpkins.

The executive director spends the next hour discussing administrative matters. The bulk of the day, from 10:30 until 3, is given over to the "regional staff development program," during which senior staff members lead discussions on such subjects as how to handle suicidal persons, how to use role-playing in the group, and how to be an effective consultant in the school system.

Why the Mobile Team Approach Failed

To provide a full range of mental health services throughout this region in Appalachia, Stai decided in 1968—after consulting with NIMH and State officials—to set up what he called a *psychiatric mobile team*. He saw it as maximizing the availability of scarce and expensive mental health professionals both to the givers of service—the members of the area teams—and the receivers of service.

The mobile team's membership comprised the psychiatrist, a supervising social worker, a psychologist, and a medical records librarian serving also as a secretary.

The psychiatrist, as head of the team, would develop treatment plans for patients, assign patients to members of the local and mobile teams, and schedule visits of the mobile team. The social worker would supervise and train members of the local staff. Su-

pervision would include help in the preparation of case histories for presentation to the psychiatrist. The psychologist would do diagnostic workups and provide consultation to other agencies and institutions. The medical records librarian, in addition to maintaining records, would handle the paperwork involved in such matters as making psychiatric evaluations for the agencies concerned with disability payments.

Though theoretically in operation from early 1968 to early 1970, this plan never really worked. For one thing, office space being limited, members of the team could function only with great difficulty in the same place at the same time. For another, because they did not live close to one another (*could not*, in a region of small towns, great distances, and housing shortages), members could rarely travel as a unit.

Stai was concerned also because the area teams, waiting for the arrival of visiting professionals, postponed day-to-day decisions and thus remained largely dependent.

All attempts to visit local offices as a team or even in smaller groups have been dropped. And the scheduling of visits of central office staff is no longer done by the medical director, or by anyone else in the central office. It is done by local teams. "We still have the same staffing pattern," Stai comments, "but we call these people mental health specialists and send them on their way as individuals."

To strengthen local responsibility still further and to standardize procedures throughout the region, Stai set up the Supervisory-Executive Council, which comprises the three area team directors and all central staff officials except the executive director and the medical director. These two were omitted in order to promote free discussion, including criticism. But one or both may be invited to attend Council meetings, which are held weekly.

Stai and Atkinson report that the new system has made for better communications, for participative management, and for area team and individual responsibility. For six weeks after the turnover, the agency's efficiency—as measured in patient-hours and in income—dropped. Then it rose above its former level.

The Care and Treatment of Patients

As in the typical urban mental health center, almost all the patients of this rural center are referred by a doctor or some other professional person or by another agency. The professional person is almost invariably a general practitioner, and the agency is most often the nearest office of Kentucky's department of economic security.

As noted earlier, the demonstration project, which preceded the present agency, held monthly clinics with the help of a traveling team from Eastern State Hospital. Stai refers to these clinics as "pill clinics"—an attempt to maintain people outside the hospital by the use of medication. "To a large extent," he continues, "the present outpatient clinics are also pill clinics. We are attempting to build in psychotherapeutic techniques but this is difficult—with a limited staff—when we have close to 1,000 patients and interview 100 new people every month."

Atkinson comments:

"We are trying to work ourselves into a position where we can deal with mental health problems before they become problems. Most of the people we run into now are people who have been chronically ill for years; some crisis precipitates a break, and we get involved. Individuals and agencies are testing us with the more chronic kinds of patients and the more severe types of behavioral disorders. About the most we are able to offer at this point—for most patients—is a medicine regimen that at least controls the symptomatic behavior. Not much insight or confrontation can be expected."

The procedure with a new patient or prospective patient is essentially as follows. He is interviewed by someone on the area team, all members of which—from mental health workers up—are known as therapists. If immediate help is indicated, the therapist himself gives it to the extent possible or arranges for it through another member of the team or through another agency. Arrangements for medication are made through the psychiatrist or, when immediate action seems necessary, through the team's consulting general practitioner. The treatment plan includes visits to the clinic for checking the effects of medication and it often also includes visits for problem-centered therapy. In some cases, the patient is asked to attend a day-care center.

There are now two daily centers—in Pikeville, serving about 60 patients, and in Prestonsburg, serving about 55. A center at Paintsville, in the Team III area, will be opened when the agency can afford to staff it. A recent diagnosis of the day-care patients at the Prestonsburg center listed 19 as psychotic, 13 as neurotic, 10 mentally retarded, 5 with personality disorders, 4 with organic brain syndromes, and 3 as alcoholics. The distribution in the Pikeville center was similar.

Because of the region's transportation problems, most patients attend the daily centers no more than once or twice a week, though a few manage to get there more often. Attendance at each main center runs to 8 or 10 patients a day. About half of these are

picked up and taken home by driver-aides operating four-wheel-drive vehicles donated by the Berea Foundation. With the agency's assistance, others manage to schedule transportation with drivers from Comprehensive Help, a program financed by the Office of Economic Opportunity. Who will be picked up on a given day depends partly on where he lives and partly on how the supervisor of the center thinks he will fit in with the group scheduled for that day.

The day-care program has always been, in Stai's words, "activity oriented." Patients have spent most of the day playing games, preparing lunch, cleaning up after lunch, talking, playing records, and working at various handicrafts.

"Medicine is basically a pacification technique," Atkinson comments. "Our day-care programs are designed toward activation. They are intended to get the patient activated, stimulated, aware of life, aware of people with other problems that are similar. Basically the idea is to get all the juices flowing again."

"We may find that all this activity is the best thing we can do," Stai says, "but we are looking around—visiting other centers—trying to get ideas that will help us become more therapeutically oriented."

A delegation from Mountain Mental Health Services recently visited the Temple University Mental Health Center in Philadelphia and came back impressed with that agency's day-hospitalization program.* Some of the practices observed there, including the election of officers, patient responsibility for much of the program, and the use of groups for discussion as well as activities, are beginning to be tried by the Kentucky center. Also, patients and staff personnel alike are beginning to be referred to as "members" and the day center as the "house."

Klein, at the Prestonsburg center, mentions a very withdrawn woman who had been treated at the clinic for several months before being assigned to day care. When the program was mainly a "free-for-all," he says, this patient, Nellie, would "just kind of float free—just hide." Now, elected secretary to the house group that meets Thursdays, she and the other officers are to run morning and afternoon "meetings" and select and guide the lunch, maintenance, and activities committees for the day. Even one meeting under the new program seems to have helped. All the patients had been asked to become aware of other patients' hang-ups and problems, as well as of their own, and to be ready to point them out. They had been asked to think, too, of what was good and healthy in other people and themselves. On the first day,

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a number of them ventured their opinions of Nellie. She seemed shocked to learn that she was considered withdrawn. She and others were surprised, too, when they made a comment or asked a question and found that the staff members were keeping quiet, waiting for responses from the group.

"From now on," Klein says, "behavior problem. are going to be criterioned by the group process. It is going to be more difficult to say to a person, 'You're acting strangely,' unless there is some kind of consensus in the house that day about the behavior of that person." He adds that what a staff member has regarded as odd behavior has generally been regarded as odd by the others also.

Mountain Mental Health Services has found Kentucky people unusually reluctant to talk about personal problems except to members of the family. This reluctance has impeded the few attempts at group therapy made by the outpatient clinics and perhaps lessened the effectiveness of the day-care program. Nevertheless, patients get to know one another quite well during the months they attend a center. They become aware of the problems each has brought with him and they may even, eventually, talk about these problems. Even though there has been little group therapy so far in the usual sense, the day-care patients have drawn strength from being members of a group. The new approach, it is hoped, will help speed the realization that a person with a problem may not depend entirely on a doctor, social worker, or nurse but must do something himself to help solve it.

Between outpatient clinic and day-care center, there is continuous interaction. Almost all day-care patients have been referred by the clinic, and may still go there for individual therapy and medication checkups. The team director and the day-care supervisor consult daily or more often in person or by phone. Therapists from the clinic are often assigned to the center either for general help with the activities or for work with one or two individuals.

Patients assigned to day care usually attend four or five months at the most. Until recently, discharge depended upon a decision either by the psychiatrist or by two or more of the other members of the team. The new policy is to put the question to the day-care members themselves. As this is written, one case has been considered—that of a middle-aged woman who had been in the Pikeville group for two months and felt that she had become well enough to stay home, especially since it was winter and she had to care for an invalid sister. The group agreed she should leave. A patient discharged from day care often continues with the outpatient clinic, checking in with it every two or three months.

In the beginning Stai had proposed a wide extension of day hospitalization benefits through the combined services of a visiting

psychiatric nurse and of the persons, to be found in any small community, who seem to be natural-born helpers. "Out in the country," he says, "there is usually some family that is taking care of people—the soft-shoulder-to-cry-on type. There is somebody in the neighborhood that people tend to go to. We wanted to take a nurse and have her work with such families who lived in close proximity to a patient, or several patients. The families in turn would see that the patient stayed on his medication, and maybe they would do some group activity planning. They would use a person's house, or a church, or a country store.

"But NIMH people wouldn't accept this proposal," Stai continues, "because it is pretty far distant from a medical model for partial hospitalization. They did agree that if we set up a more urban prototype model, we could do some of this other stuff on the side. As it developed, we have never had the staff to do both."

The idea has not been shelved permanently.

Further information on the care and treatment of patients, including an elaboration of the part played by medical men, is given in the sections describing visits to some of the center's facilities.

Trip to Pikeville

From Prestonsburg, the administrative center of Mountain Mental Health Services, to Pikeville, where half the caseload is served, is 35 miles up the Big Sandy River. The Big Sandy flows Northwest at this point, so "up" means Southeast. It is 35 miles, that is, when US Route 23 is open all the way, which it isn't and won't be for many months. Highway crews are widening it from two lanes to four, and the additional two lanes are being blasted from the mountain. The detour, by way of a one-track suspension bridge high over the river, runs to almost 65 miles and 90 minutes. It can be shortened by winding back to Route 23 after a while, over another one-track bridge, and taking a chance on not being held up by the blasting. (When Executive Director Stai goes to Pikeville from his home near 23, ten miles down, he has no choice but to fight his way through. One recent morning he left home at 7:30 to keep a 10 o'clock appointment and barely made it. He is moving to Prestonsburg.)

For scenery on the detour there are the hills and mountains, covered now with the soft yellows and browns of late fall except here and there, high up, where miners have stripped the land. Communities, miles apart, are small collections of houses and stores. In many yards sit little piles of coal. Near one town a creek flows around—and through—a couple of old automobiles, a bicycle, a refrigerator; the bed is lumpy also with cans and tires;

along the water, paper plates and sandwich wrappings are caught in low-hanging branches. (Atkinson thinks the littering can be explained by depression: general depression—psychological as well as economic.) In a low, wide spot between the hills stands a processing plant of the Island Creek Coal Co.—a complex of cylindrical structures, stacks, and piping, with smoke hanging over them and coal moving down to them through covered runways from a hillside mine. Small stretches of bottomland have been plowed. Big red trucks load at a coal dock. Coal cars are lined up on a C&O spur for a quarter of a mile. In the gray stone through which the road cuts at one point runs a foot-wide seam of glistening black rock—coal. At the foot of a hill across the road from a neat white house, a man clears a drainage ditch of mud and coal washed down by the latest rain.

Unguided, a stranger would often miss such manifestations of the region's prime industry. His eyes more likely would be on the hills, which, despite the activity on and within them, seem for the most part primeval. More than by mines he would be struck by the little burying grounds, every few miles, their gravestones arranged in a roughly circular pattern, high on a hill.

The narrow bridge leading into town bears a splendid sign: "Pikeville, All American City," a title awarded it in 1966 for such achievements as building modern water and sewage systems and a new elementary school, improving the streets, raising the salaries of city employees, supporting the library, and instituting a tax on payrolls and profits to increase municipal income. The business section seems badly crowded and somewhat dingy. A glance at the map suggests why. This town of 6,000 is hemmed between the mountains and the river, which at this point makes a horseshoe curve. Most of the town lies along the inner edge of the horseshoe, and the railroad and the highway run right through town.

Better days are coming. Under its Model Cities Plan, major improvements both in community services and in the physical environment are being or will be made. In the most spectacular of these, a cut is to be blasted through the mountains at the neck of the horseshoe and the river diverted through it, thus eliminating the horseshoe. Also into this new man-made valley will go the highway and the railroad. Besides easing traffic problems and removing the threat of flood, the project will enrich the community with more than 200 acres of one of the region's scarcest resources—flat land.

Among the projects already under way is one directly affecting Mountain Mental Health Services—a 7-story addition to the Methodist Hospital. By virtue of a \$1.7 million construction grant from NIMH, one floor of this will serve as the center's chief inpatient

facility, and another floor will provide 10 offices for the Pikeville outpatient clinic and space for the day-care center.

The hospital is a widespreading, two-story, brick structure, with extensive window space, located on the outskirts of town at the head of a hollow. Like most of the other hospitals in the region, it was built by the United Mine Workers' Welfare and Retirement Fund, and it is still often referred to locally as "the old miners' hospital". Some years ago, all the miners' hospitals were transferred to other agencies, with which the Fund contracts for services.

While the addition is being built alongside, the hospital itself is being renovated, so the mental health outpatient clinic finds itself squeezed into four rooms, half its accustomed space. Conferences must sometimes be held in the corridor.

The Use of Doctors

Mental health workers and other team members serve as eyes and ears for the center's psychiatrist. This explains how Mountain Mental Health Services has been able to operate with only one psychiatrist, currently one—Dr. Bland—who can spend only two days a week in the region.

After a staff member has interviewed a patient, he discusses his information with the team director and decides with him whether or not to present it to the psychiatrist. The decision is affirmative in all those cases—the great majority—considered a possibility for medication, and in some others.

The psychiatrist's day at a clinic is "doctor day." In Pikeville it is Friday. On that day the staff generally has 15 or 20 new patients to present and at least as many old ones it would like the psychiatrist to see again. The psychiatrist is briefed on each case, sees the patient, and decides on the medication, if any. He may ask the therapist for more information, and invariably he offers advice, such as what direction to take in counseling, what to look out for, and when to have the patient return.

Sometime during the day or, more likely, in the evening, the psychiatrist visits inmates in the county jail whom the mental health team has been asked to help. One recent night these included a man who had walked into the Public Assistance office a few days before and said he was going to blow it up because it hadn't put him on welfare. On an earlier Friday, on referral from the same office, the same man had gone to the clinic and been judged paranoiac. But he had walked out before the doctor could see him. Without a doctor's examination, the clinic was unable to certify him as sick, and without such certification the Public As-

sistance office could not put him on its rolls. Now he was in jail, where the psychiatrist saw him late in the evening of doctor day, prescribed medication, and left a memo for the area team director.

Each week in Pikeville there is a second doctor day, on Wednesday, when the team's medical consultant—Dr. F. H. Hodges, an internist in Pike County for many years, comes in for two hours to consider cases and issue prescriptions. The other area teams have a similar practice. Most of the patients scheduled for Wednesdays have been on the rolls for some time and are taking tranquilizers or antidepressants originally prescribed by a psychiatrist at the clinic or at Eastern State Hospital. If a patient seems to be doing well, the therapist copies the original prescription for the doctor's signature. The doctor questions the therapist and may ask to talk to the patient himself; he will almost certainly do so if the patient is new to him. Where there is a problem, the therapist explains it, and the prescription is written by the doctor.

What about emergencies on days no physician is scheduled? "We use our consultant," answers Stanton, the team captain. "If it is an old patient, we know what was prescribed in the past. If we've never seen the patient, we try to get some information from a family doctor. Occasionally Dr. Hodges admits patients to the local hospital for us and treats them himself." One night recently the city police picked up a 17-year-old married girl they'd found wandering around, acting queerly, and brought her to the hospital. An obstetrician she had been seeing had her admitted and asked Stanton for a consultation. She had taken an overdose of a tranquilizer. After learning some of her troubles, Stanton advised the doctor she was a suicidal risk and ought to be seen by the Center's psychiatrist. She is now an outpatient.

On each non-doctor day—a therapy day, the team calls it—the team director thinks each therapist should see between four and six patients. "They are not seeing that many now," he remarks, "because we have 10 people altogether and four offices, so everyone has to share an office and shuffle. But each patient that is seen by a doctor on a doctor day for a prescription we try to see sometime in between—to check on whether or not the medication is being taken, offer supportive psychotherapy, and help with any kind of family situation. Chronic, long-term patients on tranquilizers may be seen once a month, or just once every two or three months. Patients on anti-depressants we like to see every two weeks, which is hard to do. On the other hand, we see some patients once a week and some more often. It all depends on what we consider an appropriate form of treatment—appropriate for what we can deliver."

SOME SPECIALIZED SERVICES

Programs for Children

As the executive director sees it, the Center does "a lousy job in reaching kids." An NIMH review team has told him that in many of the mental health centers across the country about 45 percent of the patients are children and young people. But in Mountain Mental Health Services the proportion is "probably 5 percent." Here he and his clinical coordinator discuss the problem.

Stai. We are not sure why this situation exists. We know the children are out there. But how to get to them is something we really don't understand as yet. We meet resistance in the school system, in the parents. . . .

Atkinson. In the schools it runs like this: "Why should I stick my neck out for the child to get mental health services when the parents are not really interested—when they are embarrassed or for some other reason are not taking the child there themselves?" When we first opened an office in Paintsville, the school office sent us the names of 26 children who needed services. So we asked if the parents knew the children were being referred, and the school said: "No—we thought you would take care of that." We felt it was the school's responsibility. For one thing, none of us wanted to get shot at, just as the teachers don't want to get shot at—that is, get people angry at them. For another thing, we wanted to involve the schools in the helping process. If they have identified a problem, they should talk about it first with the parents. . . .

Stai. I don't think we have learned to play ball very well in somebody else's ballpark. We continually talk with the teachers, and we are making some headway: we have some school contracts in operation.

Atkinson (speaking of his talks to Pike County teachers' groups when he was director of Area Team II). I was always well received and there was always interest but very little follow-up. I think it was here that part of the clumsiness in approach came in. I really don't think there was sufficient follow-up on my part or the staff. Taking the teachers' initial reaction at face value, I expected children to be referred in droves, but they weren't. Some of the reasons were pretty complex. We almost have to talk about the political situation. The school systems comprise one of the largest payrolls. There is a large patronage system. I think that over the years it has led people to nonconfronting attitudes. You don't tend to make people angry unless it's a pretty severe kind of situation. . . . In some areas of the country there is some sophistication about the receiving of mental health services. But here if

you go to a mental health clinic you are regarded as either crazy or poor.

As one step toward reaching more of the region's troubled children, the agency recently engaged Mrs. Cathy Tarry, a former teacher, as guidance counselor. She has a master's degree in education from the University of Alabama, where she specialized in the education of disturbed children. Mrs. Tarry, assigned to Pike County, is seeing a dozen children on an individual basis, and is trying to help a number of other children by working through their teachers. Children are seen only if parents have signed a permission form and agreed to come to the clinic and to help with the treatment. The caseload is expected to grow as the schools become increasingly aware that the center now has a specialist in children's problems.

Mrs. Tarry is surprised at the extent of truancy. It makes her think there may be something unpleasant about the schools. Here she and Stanton discuss a youngster who will be coming to the clinic in a few hours.

Mrs. Tarry. This child is very bright, extremely intelligent, 10 years of age. This is interesting. I see mostly boys. This school system requires very docile behavior, and many psychologists believe that this is more easily attained by girls. . . . So I see mostly boys and I see them usually at age 10. This child is very tense, very anxious, hating school, not going to school, very disgusted with his teachers. The first day he was here, he was saying that this one teacher has a very bad attitude. So I said, "What is attitude?" and he told me that it is the total person, and it is the way he treats you. He said, "You know, she is not very understanding, she makes a big thing out of a little thing." He just went on and on describing this teacher and how he hates school. And I asked him what his plans were for himself and what is the alternative—"Are you just going to sit at home?" And he said he didn't know what his plans were and that was why he was here and I was the therapist and he was the patient. I just cracked up. I know I should have kept my cool, but that for some reason impressed me, and he laughed too. . . . He has been raised by a very hard-working coal miner (an older brother of the boy's father, now dead). He and his wife are trying to do the best they can with the child.

Stanton. The child is very analytical: everything you tell him he takes apart and then reconstructs. It is very interesting to watch his mind work. He has a great deal of insight, and you don't treat him like a child: you just talk to him. It is very easy to see him as a human being rather than as a child. When you set up alternatives for him, he can choose the weaker and stronger points. Now,

I thought we had really made progress with him because we got the kid back in school and I thought I had convinced him that people could never really get his mind because it was inside his head and it was his. But then the aunt called today and said he was crying and sick at his stomach and won't go to school. . . .

The center's children's services also include help with the organization and activities of Teens Who Care, a nationwide system of clubs to interest high school students in volunteering for community service and in considering careers in mental health and related fields. Currently the center is working with such clubs in Pikeville and in Paintsville. The Paintsville club is credited with having guided half a dozen troubled youngsters to the center's outpatient clinic in that town.

Expansion of Children's Services

As in other rural areas, eastern Kentucky has few organized recreational activities for children. The Area I team plans to help meet the need for such activities, which are considered useful in the prevention of mental health problems, by opening its day-care center, in Prestonsburg, to youngsters on weekends. The program is to include moving pictures and games. Certain day-care members will be asked to help supervise the program in the expectation that such activity will be therapeutic for members.

The agency's over-all plans for expansion, reported later, include the hiring of a children's psychiatrist to develop a program of children's services throughout the region.

Mental Retardation

The center is considerably expanding its work in this field, aided by grants from the Model Cities program in Pikeville to pay the rent for a mental retardation center in that city and from DHEW to pay salaries of the project's staff and to buy some vocational rehabilitation equipment. The director and assistant director of the mental retardation program are both natives of the region, and both are working for advanced degrees, one in guidance counseling and one in clinical psychology.

Under the plans, from 12 to 20 adults classified as either moderately or severely retarded will be trained in needed skills at an activities center, actually a school, to be open five days a week. The skills to be taught will range from how to tie shoes and comb hair—if that is what the retarded persons need training in—to how to get along with other people under various circumstances and how to follow directions. Some students will be trained for simple jobs in the community. Others will be graduated into Pikeville's sheltered workshop, expected to be developed within two years.

"In a way, our project will be like a day-care center for the retarded," says Stai. But it won't be like some we have come across--baby-sitting centers that get people in and never get them out. We don't want to get stuck with the same 12 persons year after year. We are trying to develop a system under which people graduate from one level to another."

Besides the grants mentioned, some financial help may come from the county, the State welfare agency, and the State-Federal vocational rehabilitation program, which is expected to pay the mental retardation center in some cases for evaluating a person's work potential and in some cases also for training him.

Stai's agency also gives some help to programs for retarded children, from 5 to 18. In two of the region's counties, Magoffin and Martin, county associations for mental retardation operate such programs every school day. The associations administer the programs and hire the teachers; the center provides consultation and testing services. Classes are held in Methodist church parsonages. Food for lunches comes from the school system.

Alcoholism

Almost from the beginning the center has had a part time alcoholism Program Coordinator charged with establishing AA and related groups, counseling alcoholics, and directing an educational program on alcoholism. The coordinator studied at the School for the Studies of Alcohol, Rutgers. Under a \$62,000 grant from NIMH late in 1970, this position has become fulltime, and the agency is hiring five alcoholism counselors—one for each county—to assist him. They will work with alcoholics both individually and in groups. Agency officials say alcoholism is a serious problem in this legally dry region but probably no more so than in many other sections.

Mentally Ill People in Jail

In the five counties served by Mountain Mental Health Services, the jail is still the principal holding place for mental patients and will remain so until after the agency's inpatient facility has been completed and staffed.

Ten or 12 persons with obvious mental health problems are being held in the region's jails on any given day. Some of these have been brought in on insanity warrants, resulting from complaints by relatives; others have been charged with criminal offenses. All are held in jail until it has been decided whether to send them to Eastern State Hospital or treat them locally.

In the agency's efforts to make these people one of its concerns,

staff members visit the jails daily—or at least check with sheriffs, jailers, and health officers—and the psychiatrist drops in weekly on the patients in the Pike County jail, which holds half of the total. It was a mental health worker from Area Team II, making his daily visit, who talked with the bomb-scare man and recommended psychiatric attention. And it was the agency's psychiatrist who prescribed a drug and recommended that the center arrange with the county attorney and the jailer to have the man attend the day-care center. The psychiatrist often does this. "Why don't you keep him for a while and see how he does on his medication," he tells the team director or the day-care supervisor. "And if you don't think you can handle him, or if he doesn't improve, then send him on to the hospital."

One time when Atkinson was checking the Pike County Jail, he met an elderly man who had run away from Eastern State Hospital after 38 years and made his way back to Pike County, which had been home. Now there was no place open to him but the jail; he would have to return to the hospital. Atkinson thought it a pity, and jail and hospital officials agreed. So Roberta Slone, a mental health worker on Team II, scouted around and came up with a good alternative: a comfortable home with a warm-hearted family and also something for old Ed to do if he liked—help with the garden and the livestock. The county Mental Health Association chipped in to pay Ed's board till the hospital's community placement program, which has NIMH support, could take over. Ed seems happy, and the State is saving an estimated \$3,000 a year on his upkeep. Mrs. Slone has since placed two other patients with the same family.

The center does not claim that it ministers to every jailed person who could benefit from its help. Staff members tell ruefully of a deaf and dumb teen-age boy, considered retarded, who molested a girl, was arrested, and sent to the State hospital before the agency, then in its first year, knew anything about the case. Sometime later he was returned to the jail, again without the agency's knowledge, and spent the better part of two years there before receiving a hearing—and before it was made clear to him that the girl was not dead, as he had believed, and that he was not a murderer. The agency does believe that its relationship with the law enforcement system has become increasingly satisfactory. Recently it sponsored a forum on the region's mental health problems for the benefit in particular of members of this system. The forum included discussions of mental health laws, psychiatric emergencies, and the functions of Mountain Mental Health Services. Held at the lodge in Jenny Wiley State Park, outside Prestonsburg, it

was attended by a dozen judges, sheriffs, county attorneys, police officers, and State mental health officials.

Public Information and Education

A 15-minute radio program called "Mental Health and You" is carried on each of four stations, two in Prestonsburg and two in Pikeville. Arranged by John E. Mason, the center's administrative and community coordinator, it covers such subjects as alcoholism, drug abuse, the meaning of mental health, and the work of Mountain Mental Health Services. Frequently the program is a dialogue or an interview. In the instance of Area Team III, the region's fifth station, in Paintsville, recently supplanted the monthly program with a weekly, twenty-minute program arranged and presented by members of that team. It also began carrying frequent spot announcements, with two new ones provided each week, about the agency's work and aims. Mason hopes the other teams will arrange for similar programs in their area.

Relations between the center and the region's four weekly newspapers are excellent, probably because Mason called on each editor, found out when and in what form copy should be submitted, and promised not to feel aggrieved if something were left out. News items are invariably carried, and weekly educational releases about mental health problems are carried more often than not. These releases, prepared with the help of materials from NIMH and many other sources, are accompanied by a statement that further information is available through the local or central office of Mountain Mental Health Services. So, as Mason points out, every time a release appears, at least some people are reminded that the center exists.

The center believes that its best promoters have been its patients and former patients, particularly those who were sent to Eastern State Hospital before local services had been established. A few of these former patients have even set themselves up, in their neighborhoods and their families—meaning everyone related to them—as recruiting agents for the center and as liaison between center and community. They ask a troubled person: "Why do you keep going over there to the doctor? Why don't you go to the mental health clinic?" Then they call the clinic and say: "This woman has a problem. . . . Do you think you can see her?"

The agency estimates that each professional on the staff averages one day a week in consultative services. These are still largely on an informal basis: a general practitioner wants to talk to a team director about a disturbed patient, a lawyer calls in about a client who thinks he wants a divorce but who, the lawyer

suspects, has a problem for which divorce isn't the best answer; a school principal asks how to handle one of his students.

EASTERN KENTUCKY SYNDROME: A DISCUSSION

Mountain Mental Health Services encounters many cases of "Eastern Kentucky Syndrome," a condition characterized by moderate depression, aches and pains, rapid heart beats, and spells in which the patient feels he is being smothered. It is the agency's most frustrating clinical problem. In this section, three staff members—Stai, executive director, Atkinson, clinical coordinator, and Stanton, director of Area Team II—discuss its causes and treatment.

Atkinson. One kind of case that we get all the time is a man who has usually been a miner somewhere in the area—between 25 and 50 years old—who has recently had some kind of injury in the mines and won't qualify for public assistance on disability because he wasn't hurt badly enough physically. But he has "bad nerves." He will come to us on referral to see if there is something wrong enough mentally or emotionally so that he could qualify for Workmen's Compensation, or Social Security, or a miner's pension, or Public Assistance. This kind of person is seen first by some member of the staff and then by Dr. Bland. We usually find a combination of depression, anxiety, and a number of physical symptoms associated with nerves—complaints of headaches, back pain, numbness, upset stomach. . . .

Stai. This isn't peculiar to eastern Kentucky—except for the term. The same thing occurs in the Texas oil fields and anywhere there is a high-risk occupation.

Atkinson. The doctor prescribes some sort of medication to relieve anxiety or depression or both, and we try to see them once weekly. What happens usually is that in the beginning they turn into a compensation neurosis—they are going to be rewarded for being sick if they are sick enough, so they are trying harder to be sick, unconsciously or subconsciously. They need to be sick in order to get the money from Public Assistance or whatever. If we get these people right at the beginning, we can try to ignore their physical symptoms and get away from some of these vague fears and push them to a new possibility of employment.

We feel that they are afraid to go back in the mines. They may be afraid to go back to work in general. Maybe they are afraid of a lot of things. Maybe they are afraid their role as a man is threatened—as the head of his family, the provider. They don't want to go back to work, but they need some kind of reason to explain why they can't go back to work. Well, we don't want to

challenge their symptoms; we don't want to say "Nothing is wrong with you." If we say that, it might make their symptoms come out even stronger and in a sense make them feel sicker.

What we do want to do is to direct their attention away from their symptoms and away from their fear of going back to the mines or whatever; then send them to vocational rehab for training in some other occupation. Or we suggest to them that perhaps they could do something else or get some different kind of a job. We are not very successful, very often, as far as getting them back to work is concerned. . . .

Sometimes we'll want to avoid helping a person get his compensation or public assistance or whatever until we have tried every possible avenue to get him back into shape, because once the compensation comes through, it is really difficult to help him improve. Public assistance, or welfare, in the case of a family of four is about \$150 a month.

Stanton. I've seen this in a number of cases. They start getting better and you can talk to them about "you're doing so well, you're doing so much better, that I think we can start seeing about helping you get another job or another way to earn your living," or "maybe you don't need to come here anymore." And shortly after that, they get as sick as can be and develop all kinds of symptoms. And the anxiety level goes way up. They are threatened by help.

Stai. Perhaps some kind of guaranteed minimum annual income might be the answer. We think there has to be a change in the system, because the system as it is now in eastern Kentucky does make people get sick. One of the surest ways of making a living here is to get sick or disabled because there are so few job opportunities, and these are mostly in mining—a very hazardous occupation both physically and psychologically. So there is little choice: it is either that you be a big strong adequate male who can go into the mines day after day after day or, for many people, that you be sick. . . .

The few cases where there has been some definite success are men we have worked with over a long period of time. Usually they have been in the day-care center and have been saturated with social contact, supportiveness, with acceptance, with a lot of patience, working through with them about their symptoms and about going back to work. And handling the compensation neurosis, which is a very difficult thing to handle. And in the meantime a guy has to have something to live on. The success rate with this kind of patient is not very big.

Atkinson. At least it is not big considering the proportion of

men who turn out to be productive. There is a better success rate in getting them back to the father role and manliness and a reaffirmation of the social role in the community and acceptance of the symptomatology on the part of the patient. . . .

If there were more jobs and job training, it would be a big help. The jobs are no good without the training. Many of the people have little education—close to a third can't read or write—and there is little vocational training in the public schools. So just bringing in jobs is not the whole answer: there has to be a long educational process. The technology of the mines has improved, so there are jobs open for highly skilled or skilled types of people. As for other jobs, there aren't very many open.

Stai. Year after year many people have been trained by the manpower organization and by vocational rehabilitation, but they are trained for jobs that don't exist in eastern Kentucky. The expectation is that the man will leave the area. But he doesn't stay away very long. A while back I was talking to one of the vocational rehabilitation people. They have eastern Kentucky men who have been trained, quite well, for six or seven or eight different kinds of jobs. So they will go away for a while and come back and take a "retrain" for something else. But it is usually something that is not available where he lives or where he wants to make his life. It is not a very good way to spend money. They are trained here for jobs they can only find by leaving. And it is here in these hills that so many of them want to live.

Atkinson. The most absurd example of that is the husband of a woman I work with. The husband was being paid to take training at a government training program. Many guys will make their living for short periods of time by being a trainee or by being paid while going to school, or whatever. So when one training program ends, they have to look around for another training program. Well, this guy was being trained to work in agriculture, but there are so few farms here that a guy who is trained in agriculture is going to be laughed at. . . . He told me that when this program ended and his check stopped coming in, he was going to Detroit and try to get a job on an assembly line. . . .

So there is little reason economically to get a guy better. You build him up. You get him to the point where, hopefully, he will benefit by training and get a job. And then there is so little to offer. What is more realistic many times is to help him to adjust to an inadequate system without being so incapacitated himself that he fills the role of a sick man. After he gets his compensation or whatever it happens to be, many times the mental health worker or other therapist will find ways of helping this fellow to function as an adequate man, starting very simply with things like disci-

plining the children. What we do is to help the husband and the wife find ways in the home to get him again to be an adequate kind of a figure. Even driving. One of the things we worked on at length with one man was getting him to the point where he could drive in and his wife wouldn't have to bring him into the day-care center. This was a major step forward. This was something he could do as a man for himself.

Stai. The whole coal issue is being reexamined. The big fight seems to be whether there should or should not be a severance tax on the only natural resource that eastern Kentucky has to offer. One side argues that the profits seem to be going out of the area and not back into the school systems, for instance—that the profits don't service the area.

The Big Sandy Development Commission has been fairly successful at getting some new industries in here and working with social and educational agencies. I think people are beginning to get more interested in cultural series at the colleges and in adult education classes. The social clubs seem to be getting more and more interested in the kinds of activities that will upgrade the region. The Big Sandy Development Commission recently brought in one big industry—American Standard, which sits between Prestonsburg and Paintsville. A shoe factory has come in within the last few years. There is the road construction and the hospital construction, which are temporary major industries. And the Model Cities program is a major industry.

Atkinson. One of the ironic situations is that there are so many things that need to be done in the area of social service, medical service, the educational system. And there are so many bodies needing work. Yet they are not trained to meet the needs. We have lots of unemployment, and we have a lot of work that needs to be done, and we haven't gotten the two together. This is one of the things that we do in a small way in the day-care centers. These people need services that can't be provided by building another building or building a road; they need help that can only come from other people.

PATIENTS AT A DAY-CARE CENTER

The day-care center of Area Team II has its quarters in the basement of an attractive white-shingled house identified by a plaque on the door as Heritage House, the headquarters of the Pikeville Woman's Club.

The basement is entered from outside. A quick walk through the day-care center one recent morning showed a dozen persons engaged in a variety of activities in a long, panelled, homelike room.

At one end a young man was fitting together parts of a birdhouse while a tall, older man watched, expressionless. At the other end, two women were taking things from a cupboard; nearby stood a sink, kitchen range, and refrigerator. At one of the tables arranged down the middle of the room, a rather heavy woman in a purple dress was setting up a game of Chinese checkers; at another, several men and women, seated, were making Christmas decorations. A young man with a fancy vest and a vivid tie stood watching. An attractive woman in a tight miniskirt sat on a couch along the wall opposite the entrance, fumbling through a sewing bag. Across the room and not then in use were an ironing board, a hair dryer, and a bicycle-like exercising machine.

It was a pleasant scene with only one untoward note. As the visitors left, the tall, older man who was watching another man assemble a birdhouse turned away and stared into each visitor's face with troubled, questioning eyes.

Late that afternoon, when the patients—or members, as they are beginning to be called—had gone home, Pamela Brewer and Lottie Dixon, members of the staff, discussed some of them as well as some of those who come in on other days. Mrs. Brewer, who was a surgical nurse at Methodist Hospital when the Center opened, is day-care supervisor for Area Team II; Mrs. Dixon, a widow, works at the day-care center as an aide and a driver. Atkinson took part in some of the discussions, which are summarized below. Where the discussions are reported in dialogue, the three participants are identified as *Nurse*, *Aide*, and *Clinical Coordinator*. Patients' names and some details have been changed.

The Injured Miner

Plunkett Moss, one of the persons making Christmas decorations, had been referred to Mountain Mental Health Services by a physician who wanted him placed under observation to determine if he really did experience the somatic troubles he complained about. A miner in his early 50's, Moss had been knocked unconscious by a falling beam and taken to a hospital. Diagnosis: a slight concussion. From his physician's view, he apparently recovered satisfactorily. But every time he started to go back to the mine, he got sick to the stomach. Soon he was too nervous to eat or sleep well. Then he found himself unable to drive a car, or even to pick out what clothes to wear. He complained of an aching, swollen face, of stomach pain, of spells when he thought he was going to smother. His doctor sent him to a neurologist in Pike County, to the University of Kentucky Medical Center, in Lexington, and to Johns Hopkins. There was possibly some damage, the specialists said, but it could not be verified by any known test.

The outpatient clinic prescribed a tranquilizer, for the relief of his manifest anxiety, and entered him in the day-care center, which he began attending every day. "He was such a nice man," recalls Mrs. Brewer, "and so convincing. He convinced us that his face often was swollen, and I still think it was. There would be some edema on the side opposite where he had been hit, and a little flushing. And then we would say, 'We can see this, Plunkett. This is true.' We had a terrible time getting him on anything to relieve his anxiety. It took about six months to get him stabilized on the kind of medicine he could function on."

What did she, operating a day-care center, have to do with medicine?

"I'm a nurse, and we give out medicine on the doctor's orders. The medical consultant comes here every Wednesday afternoon and sees the patients who are on medication. We watch the patients and see if they are responding, or if the medicine should be changed, and tell the doctor."

As the miner got better, he built birdhouses at the center, did some quilting, and painted pictures. Since he enjoyed working with other people, the center used him as a sort of co-therapist.

Also, as he got better, Mrs. Brewer and other members of the Pikeville mental health team began suspecting they were dealing with a case of the infamous Eastern Kentucky Syndrome. Members of the demonstration project had encountered it, but Plunkett's was the first such case dealt with by the successor agency. "It hadn't dawned on me," says the nurse. "He was so convincing, and such a nice fellow. But what we'd been doing was just supporting him in those symptoms." Suspicions became certainty when the miner gently but stubbornly, in both individual and group therapy, resisted all suggestions that he was ready to be discharged from treatment.

Plunkett's was different from most cases of the syndrome, in the experience of this agency, because he began improving *before* his Social Security disability was approved. He had even made up his mind that if the payments didn't come through, he would go back to the mine and try to get a job as watchman, outside; he didn't think he would ever go back *in*. But even after he had very gradually reduced his attendance at the center from five days a week to one day a month, he found it almost impossible to break the connection. He'd say he was making furniture at home, or that he was doing his garden, and that he was fine. But if it was all right he would like to stay on at the center a couple of more times because "I'm just afraid I might have another one of those spells." Finally Mrs. Brewer suggested that as long as he felt all right, he should stay home, and any time he didn't feel all right, he could

call up the clinic and make an appointment to come in. That was six months ago. He said he'd drop by the next month, but he didn't. He had come in for the first time that morning, after driving his wife to town for a day's shopping, because he wanted to renew acquaintances. He seemed great.

Could he support himself now? "He could if he worked long enough," the nurse said. "But now he has Social Security, so he really can't work."

The Woman With Schizophrenia

The day-care center is rarely so calm as it seems to the quick visitor. For example, the first day Barbara Strike attended she began crying when she saw men as well as women coming in. Then she hollered, "I'm afraid someone is going to rape me!" and ran outside.

Barbara is the woman in the tight mini-skirt. She had been admitted to Eastern State Hospital three years earlier at the request of her husband, owner of a small business in a community near Pikeville, and been diagnosed as schizophrenic. Some months after Barbara's return, her doctor put her in Methodist Hospital and asked Mountain Mental Health Services for help. She thus became one of the new center's first patients. It worked to find medication that would help prevent the frequent flareups, saw her husband and her in marital counseling, and asked her to attend the day-care center. She was discharged from the center, got along reasonably well with her husband and four children—one of whom has a deformed leg—for a year, had several episodes, and is back now. "She hadn't been getting any worse, really," the nurse said. "It was just that her episodes were coming a little more often. The clinic felt that she ought to come back to keep from getting really sick, as in the beginning."

Barbara's problems started after the birth of her first child, the one with a deformity. "She resents him very much", Mrs. Brewer said, "yet she tells you how much she loves him and what a good mother she is. She also tells you how much she likes to cook. One of her jobs here is to plan the meals two days a week and make out the grocery list; she says she really likes to do things like that. But the way she goes about it—SLAM, BANG, BANG: You ask her if she really likes to do this and she says, 'Oh, I love to.' It is very difficult to get the truth out of her. But now we are depending more on the group—letting the patients more or less use group pressure, and it has helped. She tells the group, 'You know, I was sick, but I'm not sick now.' And you can see the patients looking at her and showing what they are thinking: 'You are certainly not well.'"

Two Troubled Men

The man in the fancy vest, it developed, had joined the group when, for a week or two, the only other patients in it were women. "At that time he was the most wonderful thing that could have happened to us," the nurse relates. "We had some really bad schizophrenic women who would sit around looking glum and withdrawn. And he would come in and pick up the guitar and start playing. And the women would start patting their feet and they would start fixing themselves up a little even though they were married. Just having him here gave them a little incentive. He just ate it up. It is a little hard for him now, because there are other men—a lot of competition, so he keeps telling me to tell the doctor that he's sick and needs to go back to the hospital. He said it to me the other day in group, and I told him to ask the group what *they* thought. They jumped on him. 'What do you want to go back to the hospital for? 'You are no sicker than I am!' 'You're supposed to be trying to stay out of the hospital instead of trying to go back!'

"Since then he feels much better; hasn't mentioned the hospital once. He is accepted."

This man is considered to have a personality disorder. Whether or not anything can be done beyond saving him from being institutionalized, the Pikeville mental health team isn't sure.

Another member of this day-care center isn't attending sessions just now; he's in jail. In fact, John is often in jail, on one charge or another, and he has been in Eastern State Hospital a number of times. Along the line his trouble has been diagnosed as epilepsy, alcoholism, and personality disorder. The mental health team has had several unhappy contacts with him. Once, for example, it helped get him released from jail on condition that he attend the day-care center regularly. Instead he dropped from sight, took too much phenobarbital (which had been prescribed for him, along with Dilantin and Elavil), followed it with alcohol, and went out and smashed three automobile windshields with his fists.

One day four months ago, Dr. Bland, making his weekly visit to the jail, found that John had been locked up again, this time for threatening to kill his wife and children, beating up his next door neighbor, and writing bad checks—all of which John said he didn't remember because he had blacked out. On Dr. Bland's recommendation, the Pikeville team arranged to have John brought to the day-care center every morning and returned to the jail every afternoon.

Though John often displayed flashes of temper, he seemed to be getting along fairly well. One morning recently he received per-

mission to go up the block to buy cigarettes provided he return in five minutes. When he finally got back an hour later, he smelled of alcohol. (This part of Kentucky is legally dry, but liquor run in from other sections and from West Virginia can be obtained, as well as some moonshine.) Mrs. Brewer asked the group what it thought of his behavior. John said his behavior was his own damned business. The group pitched into him, saying that everybody was there to get help and that he wasn't helping himself or anybody else by going out and running around. Maybe, several members said, he really shouldn't be there. If they felt that way, John said, they should send him back to jail. "Send him back!" said one man, described as the meekest in the group, and others echoed him. So the nurse ordered him returned.

Back in jail, John took the aluminum piece torn from a pop can and cut his wrists. Then he asked the jailer to call the clinic—not the day-care center.

The cuts, as usual—this was the eighth or ninth time John had done the same thing—were superficial and did not require stitches. The mental health worker who regularly visits the clinic checks on John every day. But Mrs. Brewer, with the approval of the area team's director, has not been to see him, "because I would only be supporting him in his behavior." And he has not been brought back to the day-care center because the other members say he is too upsetting. "But it is hard," Mrs. Brewer said, "and deep down I am bothered about him. It really shook me up when they said he cut his wrists. I don't know what's going to happen to him."

One thing that's going to happen is a complete neurological examination at the University of Kentucky Medical Center, for which Mrs. Brewer helped arrange. Shortly before his latest flare-up, John gave her \$80 to hold for him. He said he had won it gambling with drunks one weekend at the jail. It is to go for any possible legal fees in connection with getting him released for the Lexington trip.

A 'Pocket' of Cases

The heavy woman in the purple dress was Mrs. Lillian James, a divorcee, about 40, who was living on public assistance. She had been diagnosed as borderline retarded, with a schizoid personality with depressive overtones. Mrs. Brewer first heard of her when the clinic telephoned one morning and asked her to come pick up a patient. So she left the day-care group go to the bowling alley as planned, with her assistants, and drove to the clinic.

Nurse. There she was. No bra. And one of those knit shirts, like a man's undershirt. . . . Her zipper undone. Her hair in long

curls. And I thought, "Thank heaven I came to get her myself." I told her we were going bowling today; and she said, "Oh, I have never been bowling." And I said, "But first we have some things to do." So we stopped and got her a brassiere and a comb and some other things and we came down here to the center and got her fixed up. Then we joined the group at the bowling alley.

Aide. We feel almost useless sometimes. But her family doctor says we have done a great deal. For one thing, she is now much better groomed when she goes to his office.

Nurse. And she does go out by herself. She does walk to the store. This was one of her sicknesses: she was afraid to go out alone.

Aide. She used to have all sorts of physical complaints and kept going from one doctor to another. Now when her legs are hurting and she feels like they are going to give way, it's because she hasn't taken her pills or because something has upset her; it isn't that she's had a stroke. She will go along with this. And if her stomach hurts, it doesn't mean she has ulcers. Or if she has a headache, that she has a brain tumor. But before—she was just in and out of hospitals, about two years.

Clinical Coordinator. She was in a hospital when we first saw her. Her latest doctor had admitted her to Methodist Hospital and—I think out of desperation—asked if there was anything we could do.

Nurse. He was concerned about the boy, too. Going on 11 and still sleeping with his mother! She couldn't see anything wrong with that. She slept with her Mommy and Daddy, too, even when she was pregnant the first time and her husband was in the Army. Now Ted has his own room and sleeps there.

Clinical Coordinator. The guidance counselor is seeing him. He's a little slow in school, but certainly not retarded, and a behavior problem.

Nurse. We're working on Lillian to let him go to camp. We'll get hold of the money somewhere.

Clinical Coordinator. Sometimes we have "pockets" of patients. We have Lillian, and now Ted, and one of the first patients I saw when I came here three years ago was a younger cousin of hers. He'd been referred because he was very dependent—didn't know what to do, or where to go. No one to support him. He was in his twenties and needing to be learning how to do for himself. So I was trying to help, and he was making progress. Then he broke off when I refused to sign a bank note with him. I had to sign so he could have money and get married. If I wouldn't sign, he wouldn't come back. I really felt bad about losing him. The next time I saw

him was two weeks ago, in the hospital at McDowell—one of our affiliated hospitals in Floyd County. He was in the waiting room, and I walked over and said, "Well, Desmond, how are you doing?" And he said, "Well, I am doing fine. I am now waiting for my wife to have her second baby." He has two or three jobs—in a gas station and a grocery store and I think doing janitorial work in some office building. How he managed it, I don't know. But I still feel that signing that bank note would have been wrong.

The Worried Husband

Nurse (taking a "paint-by-number" seascape from wall over sink). Here's something Walter did. He's another of our Eastern Kentucky Syndrome patients. (He had been working on a bird-house that morning.)

Clinical Coordinator. Imagine Walter doing this! He used to be very shaky.

Nurse. He is still nervous. You can tell that by looking at some of the fine lines here. But he holds his wrist steady with his left hand and goes to work. He says: "It is all a matter of wanting to do it. If you want to do it, you can. The longer I paint on one of these, the less nervous I am." After an hour or two he can do it without holding his wrist.

Clinical Coordinator. After his accident—it wasn't too serious—Walter hadn't felt able to work. When we first saw him a year later, he was very depressed about his inability to function as a man—to provide for his family, to make decisions for the family, and to function sexually. Or even to drive a car. The psychiatrist assigned him to the day-care center—wanted him in a situation where there'd be some pressure on him to socialize instead of just sitting home brooding about his loss of function.

Nurse. He was such a harmless, sweet, worried guy. You just felt like petting him.

Clinical Coordinator. After some months he began taking more of an interest in the center's activities, and in other things.

Nurse. He brought a driver's manual here—he had lost his license and had to take another examination—and went over it and over it. He asked for help in getting into vocational training school.

Clinical Coordinator. His powers returned. That brought a slight problem.

Nurse. His wife had decided she didn't want to take any more birth control pills. He felt he oughtn't to push matters because she might get pregnant, and they already had two children. But he got to the point where he was telling people here he didn't think he

could stand it. Two of the college students who were working here in the summer decided that this man had to have help. So they talked him into using a contraceptive and bought him some. Well, we had a nursing school student here for the summer from Berea. She was getting her degree in psychiatric nursing. The next time Walter was scheduled to come here, she was the one who was picking up the patients. Walter got in the car, and she said, "Hello, Walter, how are you today?" He said, "I'm fine. I've got my wife under control."

Clinical Coordinator. There's been a lot of marital conflict. She didn't want him to go to vocational rehab school.

Nurse. No, she wanted him at home. She was afraid. So he got another house, right near the road, where she could catch a ride to the grocery store and see people. And he got a telephone so if she ever needed help, she could ask for it.

Clinical Coordinator. I'm convinced if it hadn't been for the mental health center, Walter would have been a victim of Eastern Kentucky Syndrome the rest of his life. He was already on public assistance because, after the accident, somebody diagnosed him as epileptic.

Nurse. When he came here, he was on phenobarb, chloral hydrate, and Darvon twice a day for his headaches. Plus he was taking liquor. Now he is taking nothing but 25-miligram Thorazine, now and then when he is all tense. He never had epilepsy—he had a chronic ear infection. And his temperature was so high he would have convulsions. Vocational rehab agreed to pay for his ear surgery, so his ear was rebuilt; he has 80 percent return of his hearing. You wouldn't believe the change in him.

Aide. He isn't as likable as he used to be.

Nurse. Right. He's sort of arrogant. But he's well—or anyway, very much better. He still hasn't passed that driver's test. He says it was just his nervousness when he got there, because he really did know the answers. He's going to pass next time, he's sure.

Clinical Coordinator. This is an indication of what it may be like when he goes to school. We need to follow him closely. One of our problems is that we get a person ready physically and mentally for some service; then when he goes, such anxiety is created that he regresses.

What about that older man with the troubled eyes—the one who'd been watching Walter that morning and had turned away to stare into the eyes of each visitor?

He had just been brought in from the jail, Mrs. Brewer said. He was the man who had threatened to blow up the Public Assistance office.

A SESSION AT WEEKSBURY

Weeksbury, where Area Team I of Mountain Mental Health Services operates a combined outpatient clinic and day-care center every Tuesday, lies between steep hills up the left fork of Beaver Creek about 30 twisting miles southwest of Prestonsburg, the team's headquarters. The coal company that owned the town moved out some years ago. Company offices and other facilities are disintegrating, but the little houses were sold to the miners occupying them and appear to be well kept. A sign near a railroad crossing says: "Weeksbury—Award-Winning Community 1970. Northeast Kentucky Mountain Community Development Association."

A few hundred yards along a narrow, broken road into a hollow, a visitor comes upon one of the reasons for the award: a square, one-story building of green-painted concrete blocks—the Weeksbury Community Clubhouse. It stands at the foot of a hill across the creek from the road. A path to one side leads a short way up the hill to a privy. Much farther up is a cemetery. In a depression along the creek, downstream from the clubhouse, stands Weeksbury Park, with swings, seesaws, and a ballfield.

Inside, the clubhouse is large, bright, and even cheerful in spite of the concrete floor and walls. The furnishings comprise, mainly, a jukebox in one corner, a desk and a blackboard up front, and a scatter of folding chairs. An American flag is draped against one wall, a calendar hangs from another. A flowerpot on the desk holds artificial lilies. People are standing around, in little groups, talking. Jim Klein, day-care supervisor at Prestonsburg, is saying something to a pale young man with long sideburns. Chalmer Howard, the mental health worker who had heard about the new center while he was in Viet Nam, is listening to a large, worried-looking, middle-aged woman who is accompanied by a large, cheerful-looking, younger man.

A slim white-haired man with a ruddy complexion leaves one of the groups and introduces himself to the newcomers—Tim Atkinson, from the central office, and the reporter. He plays the *git-ar* on the radio, he says, and also at the Free Baptist Church. He has a son who plays, too. The man's mother is in the hospital and has just had a pacemaker put in her. He has a little retarded boy at home no bigger than this—he holds his hands about 18 inches apart.

Jim calls for everyone to find chairs and join the group. We sit in a big circle. There are 10 patients.

Jim opens the meeting by introducing the idea of self-government. He says the people in the day-care center at Prestonsburg

elect officers each morning and kind of run the place. The idea here would be to give everybody a say in what is done—"of course, with the advice of Chalmer and myself as to what we can do, but voting on it in a democratic way. It would be pretty much up to you—electing officers and then running a meeting like this, doing some business, deciding what needs to be done; and often maybe extending the program; and maybe later having some dues, 15 or 20 cents a week, and eventually buying things to use here, everything from Rook cards to food and coffee." He asks them to think about whether or not they are willing to accept the responsibility.

Then Jim turns to the man with the long sideburns, whom he addresses as Wylie. It comes out later that Wylie, who is about 30, lives at home with his parents and several brothers and sisters. He once worked in the mines but got dizzy spells and almost fainted, so he quit. He has a stomach complaint. When a doctor referred him to the mental health center's outpatient clinic in Prestonsburg, he was thin and shaky. In the Prestonsburg day-care center, at first, he would walk up and down with an unsteady gait, and appear on the verge of fainting; he said he couldn't stand crowds.

Jim. How long, Wylie, have you been thinking about this idea of going to vocational rehabilitation?

Wylie. Well, I've tried and tried for about five years, I guess.

Jim. What's been the hold-up?

Wylie. I don't know.

Jim. Well, how often did you go down (to the vocational rehabilitation office in Prestonsburg)?

Wylie. I tried to go down every day.

Jim. What if your job demanded that you leave the area. Would you be willing to pull up stakes and move out?

Wylie. Yes.

Jim. That sound of interest to you, Charles—that idea of pulling up stakes?

Charles (a thin young man, about the same age as Wylie; he, too, has a stomach complaint). I'm trying to get into vocational rehabilitation, I'm going to start tomorrow. And when I first started going to this mental health, they would try to get me in again and they didn't have anything open at that time and they would call me if they did have another space.

Jim. And they never got around to calling.

Charles. Nope that was about 2 years ago.

Jim. Well, I think that's about par for the course. Matt, you experienced the same thing, didn't you? (Matt is the guitar player.)

Matt. About seven or eight years ago.

Jim. Because I called the woman in the office on it and she said they destroyed or threw out records after one year. And she said she had no record of any applications. I think she has so many hang-ups there—I think she is handling about 500 applications for vocational rehabilitation. I think the only way it could be done—remember Troy—you know, he was right down there hammering at the door, and once he was accepted. But then the classes were too full. Well, he was right down there every week banging at the door and sitting there and saying, “Well, has anybody else dropped out?” And, “Have you got any room for me?” Unfortunately, they weren’t ready soon enough and Troy took off and went back to Michigan to work. (To Wylie) Do you really think you could put up with some kind of training?

Wylie. I believe I’d feel better if there was something I could do.

Jim. How about yourself, Charles?

Charles. Well, I don’t know whether I’d feel up to it or not. But I’d try it. You can always try a thing once.

Jim. Do you think your feeling weak at times and everything would throw a block in your way of completing it successfully?

Charles. Well, if I could find some work, it might be that I could build myself up, and keep on a little bit at a time.

Matt. The rough thing is that sometimes in winter time you can’t get out and you’d be waiting at home all the time.

Jim. There’s a lot of truth to that. Just look at what we are already experiencing with Comprehensive Help. Some of their vehicles are broken down, so about four people aren’t here today. (Comprehensive Health as noted earlier, is an antipoverty program funded by the Office of Economic Opportunity. In the region served by Mountain Mental Health Services it has been trying, among other things, to meet emergency needs for transportation and medical help. It has carried a number of the agency’s patients to clinics and day-care centers. I’m sure with winter coming it is just going to get worse again—not being able to get back in and get some of the people out, and they will be staying at home all the more. Dorothy, do you get out much?

Dorothy (a young woman in a blue suit). No, not really. I guess up here is the only place I go. I don’t have a driver’s license. I could walk, but there’s no place to go.

Chalmer. Have you started working on your driver’s license?

Dorothy. I sure have. You got to learn the rules first, you know. I really want to be able to drive well. I had to get over a scare I had a long time ago.

Matt. You know, I want to get a license too, Jim. Mother has been very, very serious. I've been setting up, and this and that and trying to help her

Jim. This Matt here, he would like to speak just a minute.

Matt (addressing the visitors). Well, it's on my mind—some little words about the hospital and this mental health place. It has been my only grace—the hospital never was. We need more like 'em, we need more social workers. In our clinic, I think you few people have done a wonderful job. When I needed help, they helped. They helped me at the hospital. I can't hardly put my expression in it. If everybody felt the way I did—I was really sick, nervous. With all my love from the top to the bottom of my heart I give the best regards to the mental health, the hospital, the workers, and all the staff, too. . . . When you are in trouble, you need help; when you're sick, especially. And a lot of things I don't do. There is nobody perfect here on earth—only one man perfect and that was Jesus. And they crucified Him and they done everything to Him. . . . Here in my heart, that's where the faith is—here in my heart for the mental health. . . .

Jim. You are one of our biggest publicity agents, Matt—that's all there is to it. You just like to talk, too.

Matt. No, that's serious. I wanted to put my expression to it. I would like to let the world know what the social workers and the mental health workers are doing to help us. I am not doing that to brag on myself. I mean that from my heart.

Jim. I know. (Turns to another patient.) Caroline, how do you feel about that? Any change in the way you have been feeling since you have been coming down here, the past three or four weeks now?

Caroline (a young Negro woman who has been in the State hospital several times but not since becoming a patient of the mental health center, a year ago). Yes, better.

Jim. What do you think is your biggest problem right now?

Caroline. Nothing, now. I'm taking pills and I'm feeling all right now.

Jim. And what happens if you get off your pills?

Caroline. Nothing much, just my nerves, nothing.

Jim. Well, something happened a couple of weeks ago. Your parents were getting ready to take you off down to the hospital.

Caroline. My nerves were getting upset again. . . .

Jim. As long as you take your pills and talk to us here about your problems at home, Caroline, do you think that helps?

Caroline. Uh, huh.

Jim. I know you and Charles had about the same kind of problems when we talked together the other week. Remember how he was talking about how he gets along at home sometimes—the things he does? How he gets all frustrated at the other members of the family when the television is going on too loud or they have the radio on too loud? Have things been happening to you again?

Caroline. No. I don't look at the TV too much. I go up and visit—

Jim. Why do you do that, Caroline?

Caroline. To keep my mind occupied.

Jim. Does it help to get out of the house and away from your dad and mom and the others?

Caroline. Yes. . . .

Jim. What is your feeling about the program, Wylie?

Wylie. I think it is a perfect place. When I came here, I only weighed 125 pounds, now I weigh about 165.

Jim. Has it helped you to understand your own feelings a little more?

Wylie. You bet. But I don't like a crowd of people. . . .

Jim (to tall, black-haired man). Dave, what were the advantages or disadvantages of going to Prestonsburg before we opened in Wheelwright and then here?

Dave. When we were going to Prestonsburg, it was a time just trying to gather everybody up. Some would be up here in Weeksbury and some would be up at Jack's Creek, and by the time we got to Prestonsburg, it was almost time to come back.

Chalmer. What made up your mind to keep going even though it was so hard to get there?

Dave. Well, you got to keep on trying. Otherwise I'd just be up at the house lying in the bed.

Jane (the large, worried-looking woman). I would just say if it hadn't been for you all, I guess my son—I guess I would have lost him, because you all know the shape he were in when you all seen him, 'cause you all were talking about sending him to a hospital. . . . And so it was a near miracle. And they gave him a shot and some pills and sent him back home. . . . These nerve capsules the doctor gave him, they wouldn't do him any good whatever—the pills wouldn't do him any good—till we got fixed with you all. . . .

Jim. Lester, what do you think about what your mother is saying?

Lester (the large young man). I think what she is saying is true.

Jane. Of course I did feel a little afraid, but lately I'm not a bit

scared about him walking down to the neighbor's house. I know he takes his medicine. And why? Because he listens to you all.

Jim. Why do you listen to us, Lester.

Lester. Because I am feeling better. I don't have the fits now—I used to take those nerve pills. I guess it's been about a year now.

Jane. I really appreciate it more than anybody in the world.

Jim. The thing is, Jane, you can't always be so overprotective. You can't always be around to take care of Lester, you know.

Jane. Yes, I have always been good to him.

Jim. Yes, but you aren't going to be here forever.

Jane. Well, he scared me when he went on the highway, but somehow I went and got him out of the road. I bet there were more than 15 cars come along.

Jim. Well, that's good. But, Lester, do you like your mother to be so concerned about you—watch over you so much?

Jane. Yes—

Jim. That's all right, Jane. Lester and I can talk. Do you think your Mom watches over you too much, Lester? Do you like that—that she takes such care of you?

Lester. Yes, I do.

Jim. What I am wondering about is when your mother dies will you be able to take care of yourself?

Lester. I don't know about that.

Jim. That is what I think is important, too, Lester. She is not always going to be around to take care of you, so you will have to start doing things without mother telling you—take care of yourself, the house, things that you will have to do whether or not your mother is around. Do you understand that, Lester?

Jane. Yes, he understands.

Jim. He can answer me, Jane. Do you understand, Lester?

Lester. Yeah, I understand. The trouble is I never had to take care of myself or anything.

Jim. Well, I think you are going to have to start one of these days—not that your mom is going to die soon or anything like that, but it takes a while to get accustomed to taking care of the house.

Lester. I don't believe I could.

Jim. How about building a fire?

Lester. Yep, I can build a fire.

Jim. Can you wash clothes?

Lester. Nope.

Jim. Without food and without clothes, how long are you going to last?

Lester. I guess I'll be dead in a month. (Laughter)

Jim. Do you bring the coal in?

Lester. Yeah, I take it in to keep from freezing.

Jim. Well, that's good enough. You don't have to be told when to take it in.

Lester. I help get the kindling in and the water.

Jim. That is good. You don't have to be always told when to do it. That right, Jane?

Jane. Yep, that's right. Sometimes I have to tell him to go get the kindling. He's not afraid to go to sleep. He was told by the doctors not to always sleep, and now I say, "go get some water or get some kindling," and I say, "you're not laying down on that bed now."

Jim. Have you been able to eat anything, Lester?

Lester. Yep, I been able to eat right good. (Everybody laughs except Jane.)

At this point, the visitors had to leave. One of the patients who had refused to be drawn into the earlier discussions then said (Klein reported the next day): "Let's get back to this voting business." So they had talked about it for half an hour, till 12:30, the consensus being that, yes, the group should elect officers and run its own affairs. The question would be discussed again the following week. Then the group had broken up, and for another hour or so members had spoken privately to Klein or to Howard about matters they had considered too personal or too unimportant to discuss in the group. This hour and a similar period beginning at 9:30 in the morning, constitute the outpatient-clinic phase of the day. It includes the dispensing of medicine to those known to be running low and for whom a checkup by a doctor at the Prestonsburg clinic is not considered necessary. That morning, for example, Caroline had been given a refill of tranquilizers, for which her mother had paid with 100 pennies wrapped in a paper napkin.

Persons in Need of Feeling Responsible

Asked about Wylie and Charles, Klein said their interest in vocational training had surprised him because they had never before, in eight months, mentioned the subject. The day-care supervisor was inclined to think the weather was largely responsible. "It was a miserable day, winter was coming, and they were going to be stuck in the house. They can't work in their gardens.

They each have a little patch of tobacco, and they can't work in that. They can't what they call 'gin' around the house—you know, get out and walk around and play horseshoes. They are really concerned. They are going to be stuck in the house, under the protective wing of somebody, all day long."

On the way back from Weeksbury, Tim Atkinson had expressed the same thought—that vocational training was beginning to look very good as an alternative to spending the bleak eastern Kentucky winters cooped up at home.

What could the center do for such persons?

Klein said he hoped it could help them develop dignity, independent thinking, and, most of all, responsibility. They needed to feel responsible for themselves even if they lived at home. They had to get to the point where they couldn't say they were staying home and doing this or not doing that because of somebody other than themselves. At present they were blaming a lot of other people. "They have never really gotten out of the house—never felt the experience of how it is like to be a man and to be independent."

Caroline's trouble was very similar, Jim said, and so was Lester's. The woman in blue who wanted a driver's license, he went on, was still primarily a patient of the Prestonsburg clinic, as were some of the others. She was suffering from a depression, following a sudden bereavement, and the team director had asked her to attend day-care sessions as a means of helping her get out of the house and into activities not concerned with family and children. She needed to feel she was somebody in her own right.

Working Without a Job

Matt, the guitar player, Klein said, is "a beautiful guy" who has been diagnosed as schizophrenic and several times been in Eastern State hospital. "It's unfortunate that the idea, the overall theory, of mental health," Klein said, "doesn't adapt itself to the people. What is mental health down here, for example, ought not have to be considered mental health in New York or Chicago. And the other way around." Klein seems to feel that Matt, considered in relation to the mountain culture, is much healthier than his history would suggest. Though he has never held a steady job, he is always busy. He helps out at a children's day-care center, serves with one of the county's rescue squads and attends all its meetings, is an active volunteer fireman, has a hand in other volunteer activities. "This is work to Matt," said Jim. "He works an eight-hour day fulfilling service—for about six months; then everything seems to fall apart. He wants to get away from the whole scene. He gets angry at the children. He cusses his wife. So he just

leaves. Maybe he'll hitchhike to Chicago. He's gone two weeks, and his wife doesn't know where he is. He comes back and he feels good and he's ready to exist for another six months."

In addition to this off-normal behavior, as a reason for hospitalization, Jim points out, Matt might have been considered delusional because of his religious haranguing. "He's very pious, but only superficially. He sings. He's on the radio. God is everything. God is wonderful. 'God' really covers up a lot of animosity." It seems that Matt is often ill-treated by some of his relatives; sometimes he's even beaten. "He resents this, but he can't be honest with himself. He just can't be honest with anybody. Everybody is wonderful and good." In some people's eyes, too, Matt is considered odd because he gathers pop bottles. This last year he collected 20,000 of them from roadsides and creek banks and thus made several hundred extra dollars for his welfare-sustained family.

To ease the situation at home, Klein is trying to persuade Matt and his wife to place their two-year-old retarded son in an institution. He recalls a case in his own family—a relative grown to adulthood, his mother dead, his father giving him fulltime care at home. "So I can just see what they've got to go through. Unfortunately, they all feel about suffering in a very fatalistic way. Matt thinks he himself is to blame. He's just loaded with guilt." Klein hopes he can bring Matt to talk about it.

QUESTIONS OF MONEY

The center's budget for 1970 was \$322,000. About \$132,000 came from the NIMH staffing grant, \$78,000 from the State department of mental health, and the balance from services. Money paid for services included approximately \$60,000 from Medicaid (which pays at the rate of \$16.80 per visit), \$32,000 from a contract with the United Mine Workers Rehabilitation and Retirement Fund, \$2,000 from school systems, and \$5,000 from other agencies.

With new and broader services, the budget is expected to rise in the near future to about \$1.2 million. The expansion is already under way in programs (a) for alcoholics, financed mainly by a \$62,000 staffing grant from NIMH, and (b) for mentally retarded persons, financed in large part by a staffing grant of \$23,500 and a Mental Retardation Adult Activity grant of \$35,000 from the Division of Social and Rehabilitation Service, DHEW.

A considerable expansion of the general professional staff accounts for most of the rest of the projected increase, both in services offered and in money required. The center hopes to engage two fulltime psychiatrists to replace the present part-time

man. It also hopes to expand its admittedly weak children's program by adding a children's psychiatrist, also a supervisor and a teacher for a children's day-care (meaning partial hospitalization) program. The center sees a need as well for a psychologist with a Ph.D., several additional mental health workers, and eight more psychiatric nurses. The nurses would staff the center's inpatient facility, and one of the psychiatrists would have to give much of his attention to the patients in this facility.

Whether or not this planned expansion will be realized in the near future depends first of all on the fate of a requested new NIMH staffing grant totalling some \$400,000 a year. The grant has been approved but not funded. The expansion depends also upon the center's ability to raise the non-Federal part of the budget. Stai expects to do this largely through increasing the income from services. While such income now accounts for roughly 35 percent of the budget, the executive director estimates that it soon can be increased to 45 percent and eventually to 60 or 70 percent. He bases his estimate on three beliefs:

- The income from expanded services will rise proportionately with the costs of providing these services.
- The staff development program—which will be expanded as new professionals are added to the center's staff—will make the less experienced therapists more able and therefore more willing to handle patients themselves and to see them as often as necessary. Stai has noticed a tendency to schedule patients' visits for hours when the psychiatrist is at hand; consequently, services and income per therapist are less than they might be.
- Some of the consultation services that are now being given without charge can be placed on a contractual basis. The main hope is for contracts with school systems and courts.

Some members of the board of directors of Mountain Mental Health Services have expressed a little worry over the center's ability to handle its expanded budget when Federal support ends. They wonder if it is quite fair to bring professional workers into the region unless the center is sure for years ahead where their salaries are coming from.

Stai is optimistic, and the Board, in spite of the expressed worry, supports him fully. He points out that under a recent Kentucky law, counties are permitted to support mental health services by imposing a real estate tax of up to four cents per \$100 valuation. Such a tax throughout the center's catchment area would raise about \$250,000, which, with income from services and support from the State, would enable the center to meet its expanded budget.

The people of the five mountain counties would not approve a

mental health tax next year, Stai is sure, nor probably the year after. "But I don't think the situation is hopeless," he says. "We have about six years—before Federal support ends—to demonstrate to the communities that we offer a needed and reliable service. Direct services are absolutely necessary to demonstrate the value of a mental health center. With every month we are offering more of them to more people."

Staffing Grants: 04-H-000285, 04-H-000457-01

Construction Grant:

Grant to Predecessor Project: RO1 MH 14974

Date of Interview: November 1970

Operation Hope: Educating New Leaders

Director: A. PAUL PARKS
 Operation Hope
 Los Angeles, California
Prepared by: GAY LUCE

At a time when the voices of despair are registering with ominous clarity, a small project in Los Angeles is offering an antidote to the ugly waste of young people in urban ghettos. Operation Hope is an experimental training program in which 20 young men and women from Central and East Los Angeles are being helped through college, and encouraged to acquire the skills and credentials that may make them the new leaders in mental health professions such as social work. The program provides a monthly stipend of \$200, the *sine qua non*, which combined with parttime job income, permits the participants to study. Moreover, the three staff social workers, Director of Research, Administrative Assistant, and outside consultants of Operation Hope provide special courses, legal and psychological counseling, and assistance during financial and family crises. These young people from the ghettos are likely to revitalize the mental health professions, at a time when welfare and social workers are often seen as middle-class visitors, as outsiders who are ineffectual and hated by ghetto residents, and who seem incapable of devising programs that will attack the consequences of poverty and crowding.

No neat formulae can be offered for selecting and educating ghetto residents, but the program evolved by Operation Hope offers a guideline that could be adapted to any city location. The impact of this program cannot be measured by statistics, since only a few participants have been funded, but the school performance and careers of its trainees will be noticed in the next decade as these people become poverty lawyers, teachers, and mental health workers in the neighborhoods they know well.

Background

It is shocking to discover that close to one out of every six Americans lives in a poverty pocket, an island of hopelessness

surrounded by affluence. Innercity ghettos do not communicate with the "outside world"; however, the young, who have grown up in an era of television, have seen the widely advertised wealth and "opportunity" that lies only a few miles away. For them it is as distant as Hawaii. These street-wise young people, who are old by 21, know all the discrepancies between promise and actuality. They know that the promise of free education, of job opportunity, of legal equality differs from the actuality they experience. They know that the ostensibly free clinic is a place where they are rudely treated, and where a sick man may suffer for many hours in a waiting line. If they are black or brown, they know they may be sent to jail while a white Anglo is set free for the identical offense. They may know of jobs, yet in a city like Los Angeles they cannot get to them because they do not own cars and there is virtually no public transportation. Many of these students are bright and do well in grammar school, but by high school they drop out as they begin to be inundated with financial and family problems. If they are spunky they are likely to be pushed out.

Traditionally, the people who have tried to help have been sincere and hardworking social workers, people who still come from comfortable middle-class backgrounds and merely visit the ghetto, escaping to a clean quiet home each night. Despite their good intentions, social workers are inevitably seen as transient visitors, and hated by the people they aim to help. They are viewed as spies and purse wardens who enforce moralistic rules which have no relevance. At an early age many children conclude that the case-worker is merely snooping when he asks questions, ferreting out some misdemeanor or technicality that means the family will not get money. The familiar stipulation that welfare recipients would receive no money if an able-bodied man were in the house has created deceptions and family disruptions that have warped the lives of entire generations. The tragedy is typified by a girl in the program who fought and hated her mother throughout her life, and only later discovered that her father had been driven from the house by the welfare act, not by her mother. By that time she and her mother were permanently estranged.

Under pressure and without outlet, despair, passivity, and withdrawal into multisubstance use, such as alcohol and dangerous drugs, are the inevitable concomitants of a life with ramified health problems, and perpetual family crises. Hundreds of thousands of potentially bright and creative youngsters are being warped and wasted. Ghetto existence cannot be patched. Today, ghetto youth live in an ironic vortex of history, marked by the threat of population growth, the exodus of middle-class families to the suburbs, inflation, and war. Ironically, the pressure is on the

young, themselves, to rebuild or create the institutions that will readmit the poor into the mainstream of American life, a life of decency and opportunity. Nobody else can do the job.

Considerable institutional and social changes must be constructed before this portion of the American people can participate in its own future. At present there are no institutions that can fully supply city ghettos with the most basic necessities—good housing, health care, and education. The need is for change in institutions, policies or social organizations as they now exist. In a dynamic society institutions should change to meet changing needs. The question that faces our society is how to revitalize our institutions so that they maintain health and well-being. It seems improbable that these institutions can be fashioned by people who live far from the ghettos, and who know the problems only by reading. The hope for constructive institutional changes emanates from within. Operation Hope was evolved to select potential leaders, and give these young people the instruments for institutional change, supplying them with the education that is the key to social participation. It is hoped that this program may lead to changes in the selection of personnel for the mental health fields.

History

Mr. A. Paul Parks, the originator and guiding spirit of Operation Hope, came to Los Angeles with the conviction that his profession of social work needed to be revitalized. An Easterner with a varied work experience, he had extensive experience in the field of drug addiction. He had conducted educational seminars for community physicians on the social implications of drug abuse. Like many of his associates, he began to see that drug addiction and other major social problems could not be treated as if they were local "infections" that could be diagnosed and cured on an individual basis. The traditional medical approach is rarely relevant in the attempt to counter drug abuse. Drugs of all varieties have been the escape of people whose lives are intolerable throughout the centuries and in all countries of the world. Life is indeed unendurable for the very poor and no amount of patching can alter the fundamental trap or the isolation in which the poor, and particularly the black and brown minorities, now live. Neither preachment nor punishment can eradicate the alcoholism and drug use and other consequences of a degrading mode of living in a dishonoring environment.

The helping professions have not always given credence to the fact that human behavior is adaptive and learned. This implies that each community participates in shaping the lives of its citizens and their behavior. In actuality, social work like many other

helping professions has often used its power and position to label behavior—an approach which does not produce the techniques that contribute to healthy reactions or change. In gaining status as a profession, social work in some settings has also moved further away from the people it originally set out to work with.

In the early 1960's, social work groups were seeking new solutions to ferment in the ghetto, by recruiting and training local young people for social work. Mr. Parks moved West to join an agency known as Special Service for Groups, Inc., at a time when it was training gang leaders from Watts and East Los Angeles as social workers' aides. He arrived in Los Angeles on a hot August day in 1965, one day after general discontent had combined with heat of summer in the destructive insurrection that came to be known as the Watts riots.

Watts is a remnant of a real estate tract in South Central Los Angeles, but the action that America remembers occurred west of Watts in an area housing some 400,000 people, 300,000 of them black. These people have no access to the resources of the larger city. Poor, they lack transportation, and are unable to work outside their neighborhood. Thus, in their out-of-the-way enclave, they remain invisible to the affluent majority. Here, on a hot night a small incident with the police generated rumors and crowds that slowly swelled into a populace-police battle culminating in the deaths of 34 persons and the destruction of millions of dollars in property. Watts became the predictive symbol, reminding Americans that poverty and racial oppression were hidden in the affluence, and that the problems of huge groups of American people were being neglected. The "Watts riot" announced that this double state could not exist any longer. Two years later Boyle Heights became the center for the development of new solutions, the headquarters for what is now Operation Hope.

Location and Staff

Roughly two miles from the modern Civic Center of downtown Los Angeles is an old barrio—Boyle Heights. With the adjacent neighborhoods of East Los Angeles and City Terrace, it houses about 180,000 people of whom 135,000 have Spanish surnames. Boyle Heights is bounded by freeways, an area of 150 blocks through which many waves of immigration have passed. Like a port of entry to the city, it has received successive waves of Russians, Serbians, Italians, Jews, Mexicans, and others. At present Spanish is the major language and many of the older Mexican-Americans carry on the traditions of their mother country. In the ghettos and barrios of South, Central, and East Los Angeles few new homes have been built for 20 years, but as middle-income

people fled to the suburbs, black and brown people took their place. It is in the center of this multilingual ghetto that Operation Hope was established in 1968, setting up offices in a few rented rooms.

The four staff offices, the large anteroom and classroom were carefully chosen, for these are not only the working headquarters of Operation Hope, but the center of all activities, seminars, and consultations, the one meeting ground for its many disparate participants. The rooms are spacious and friendly, containing the bulletin boards of events, duplicating equipment, and an incipient reference library for students.

Mr. Parks drew together a staff as varied in completion and background as the students he would seek out. It had to be a group of exceptionally experienced and committed people, because the entire staff would include only five people, and they could anticipate working around the clock, in every conceivable exigency. The staff all had extensive social work experience, and each person came from a different part of the country as well as different ethnic backgrounds. They are supplemented by consultants and instructors.

In philosophy the staff agreed. They had all personally seen the failure of the medical model of social work. They had, themselves, been trained to act as professional social physicians who would diagnose a needy client's problems and try to repair them in the manner of setting a broken bone. Since the ills almost inevitably lie in the complex social environment, not the individual, the medical approach to social work is extremely frustrating. The staff, therefore, felt that a new approach was essential that the people should be selected for the helping professions, out of ghetto areas, not the middle class, with the hope that these indigenous people would invoke needed social and institutional changes. Fortunately, one member of the staff has long been a resident in the neighborhood, and is known among many people in Boyle Heights. It is rare for a project to have on tap a person who is familiar with the history and problems of the people just outside the door.

Many Los Angeles people from wealthy neighborhoods have visited Mexico, but have not heard of Boyle Heights only a few miles away. They would feel as out of place there, as in a foreign country. It is a distance and contrast that cannot be overemphasized, for Los Angeles sprawls over an area of about 400 square miles. Among its eight million people, some epitomize the wealthiest in suburban living, while close to a million represent the most hopeless isolation of poverty. The facade of poverty in Los Angeles is prettier than that of Eastern cities because there are houses and trees, but the isolation is more exaggerated because people who do not own cars cannot leave their neighborhoods. Beaches,

museums, plays, and concerts, taken for granted by middle-class youth, cannot be reached without some form of transportation. It is worth repeating that jobs and schools are similarly out of reach for those who cannot afford cars. Thus, the misleading facade of small white houses and palm trees belies a greater isolation and deeper abandonment than the visual filth of a New York City "slum."

Most of the institutions that might change the vicious cycle of mental illness and misery that takes place in the ghetto are also too far away. The people who make the decisions allocating money and setting up basic requirements for housing, health, and education are far removed from the realities of the poor, particularly the poor minorities, the blacks, Chicanos (the current local term for socially active Mexican-Americans) of the West and Indians throughout the country. Middle-income Americans hear statistics about Government budgets and visualize free, tax-supported education that is available to all, as well as free clinics in hospitals, that make medical care accessible to everyone. The services are available on paper. If they are to be made a reality for the people who need them, it will happen when ghetto people, themselves, have the education and credentials to attain positions of authority. As all the great voices from the depths of ghetto life have tried to explain, the forces of jungle survival bruise and also strengthen a person, thus creating an individual for whom the games of middle-class education are particularly difficult. The very people who must lead ghetto improvements are therefore not easy to mould; they have needs that are not easily met.

Recruiting the Model Trainee

In discussions with a community psychiatrist, a psychologist, and social workers, Mr. Parks and his staff had evolved a profile of desirable traits—a checklist that might be used in interviewing prospective trainees. They wanted youngsters who were dissatisfied, but not passively disgruntled; students who wished to bring about change, yet who had attractive personalities. They needed young people with fire who wanted to learn rather than destroy; people with a sense of justice and motivation. How did one find a young man in the ghetto with fire and talent who had not been too embittered, beaten, legally entangled, mentally warped, or addicted to drugs? The young people had to have developed the strength to survive in the ghetto. They had to be people who knew how to fight, were wise to every con, and canny in the brutal realities of their own neighborhoods. At the same time, they were going to be asked to incorporate a new style of living, adopt a genteel manner, and survive in another world of middle-class col-

lege life, learning the subtleties of bureaucracy, and the language of the affluent world. They had to be people who could survive in both life styles simultaneously. These qualities should strike the reader as remarkable, given the environment from which the trainees were sought. It is astonishing that people with such qualifications were actually found. Most of them had been in trouble with the law. Some had been involved with drugs. Any youngster with the spirit and independence of mind to become a leader was automatically too spirited to be considered desirable by teachers and educational authorities. Yet, it was precisely the school "troublemakers," the questioners, fighters, activists, who were the objects of the search.

The Operation Hope staff began their quest by asking for referrals from social workers and teachers. After the Watts riot, Central Los Angeles was inundated with community programs. Nonetheless, when the staff looked for applicants from the Educational Clearinghouses, from schools, social agencies, or ethnic organizations, these agencies could not produce a single person to fit the criteria. In general, schools and agencies were antagonistic to the aggressiveness and spirit that would qualify a student, and in the end they did not help at all.

Not many social workers or teachers actually live in Boyle Heights or other ghetto areas. The ghetto's daily rhythm begins with an immigration and ends with an exodus. From the arrival of milkmen in the morning, the police, the teachers, storekeepers, bankers, and social workers flow into the area. In mid-afternoon, when the teachers begin driving to their homes 20 and 30 miles away, the exodus begins. In this ebb and flow, the teacher or social worker is, in fact, a stranger, a visitor, who does not know the families of the children he teaches or people he tries to help.

After six months of searching the network of social agencies and the neighborhoods, the staff of Operation Hope had to change its initial image of a potential leader and the means of finding him. Many of the young people with leadership qualities had been so emotionally damaged and brutalized during childhood that they could not remain sensitive to other people. Often they were withdrawn and suspicious. The staff began to look at the habits of potential candidates, seeking people who had spent time helping others. Ultimately they did find anomalous people, a man from Watts who was teaching youngsters by coaching them in sports, a girl who had worked with Head Start. After interviewing some 60 people, four prospective students were found, and through them a grapevine was begun that finally attracted some 200 others. The kinds of students who had unbroken spirits, who wished to help others, and could use their anger at social injustice for construc-

tive change were to be found on street corners, in picket lines or community demonstrations, not in welfare agencies.

After months of recruiting, the staff found 33 qualified applicants, but they had funds for only 20. They selected the people who seemed to have the rarest combination of qualities, leadership ability, and sensitivity to other people. Now they were asking these students to hold their anger and their action in abeyance, to take on a middle-class life style, and to postpone their effective action until—perhaps seven or eight years later—they had their credentials. It meant a long-term commitment to an educational program, postponing rewards, and suppressing many of their normal feelings. At a time when many of the disgruntled youth of the United States had given up hope of working through institutions, these students were asked to gamble on the hope that they could later constructively change conditions through the instruments of the establishment. This is some measure of the remarkable men and women who have been chosen to participate. To them, indeed, the program seemed unreal at first. As one man said,

“At first, I thought you people were from Mars, then I decided you were the ‘fuzz’ trying to find out what minority people were doing. Right now I do not know what your bag is because I know nobody gives a person money to go to school, but it’s a groovy program, and I am making B’s for the first time in my life.”

The Colleges

Originally, the staff had planned to pick 20 trainees and supply them with money enough to graduate from a State or city college, while offering them special courses in social sciences and remedial work. It was soon apparent that the tax-supported schools were not amenable to these students despite their facilities. Theoretically, California offers virtually free education for all qualified residents. Actually, the State colleges charge about \$150 a year and some fees are over \$200, an amount that is formidable to these students. In addition, books cost as much as \$125 a year. State universities charge \$775 per year plus special fees and books.

Most of the ghetto youngsters have missed classes in order to work, or have dropped out of high school in discouragement; one girl dropped out of high school two weeks before graduation, and nobody in her school acted to get her a diploma. Many others have been flunked out for questioning the teacher or expressing opinions. Since the State universities admit only from those students in the top 12 percent of the high school graduates, while the State colleges accept students from the top third, most ghetto students could not qualify, however innately intelligent they were. State colleges may admit 2 percent of incoming classes as members of

minority groups and another 2 percent who show promise despite low test scores. On the other hand community colleges take anyone with a high school diploma. A few of the trainees had already entered local two-year colleges on their own, but the administrative bureaucracy was so frustrating that after two-and-a-half years one student had never had the opportunity to discuss his curriculum with an advisor. He had taken endless courses and yet had not fulfilled the requirements to graduate. Another student had piled up 30 course credits without completing any of the basic courses to graduate. At the larger schools, the State colleges, the coldness and rigidity of the administration made the students feel they were not wanted. The unfamiliar routine of application forms and interviews resemble social welfare agencies. As one student had said about bureaucracy, "The place is designed to frustrate you. By the time you explain what your problem is to a number of people, answer endless questions regarding why you had the problem, fill out endless papers—and the waiting is awful—you will be told you will be seen at such and such time by Mr. so and so, and you wait some more."

It was finally necessary for the Operation Hope staff to negotiate scholarships for their trainees at small private institutions, and the students were finally placed at Occidental College, Pepperdine, Whittier, Marymount, USC, and other schools around the metropolitan area. The students had to be helped through high school equivalency exams, the red-tape of application forms and transcripts, and enrollment. They needed additional funds for books, and continuous emotional support. One college administrative official told Operation Hope staff: "We will consider applicants from your program as long as you are available to give support. From our experience minority students will not use school counselors within the institution."

The process of educating young men and women may seem a straightforward matter of funding and organization but it is a subtle and ramified undertaking. Unless helped with all the exigencies of survival, with living needs, books, and emergencies, the student would have to be absorbed by the all-demanding hustle to exist. Although studying may ultimately liberate the student, the first impact is one of extreme tension. Students have to survive not only at home, but in a new environment that is hostile, on a campus whose very philosophy is antagonistic to them. For instance, Chicano students are affronted to find that their hero, Cesar Chavez, is considered a communist agitator by many students, and the black students are amazed to learn that the charismatic Malcolm X is considered merely a criminal by middle-class whites. This is tantamount to sending a devout Christian among

people who call Jesus a communist provocateur. On campus the values, dress, language, and social life are all unfamiliar and somewhat threatening. Moreover, the average college student is still partly a child, involved and dependent upon his family, while the ghetto student has been a street-wise adult for some years, depending upon his wits, often supporting or helping to support a family. For the white middle-class student, college may be a slight strain, a first venture away from the comfortable family enclaves. For the ghetto student it is another country, one in which he is scorned because he does not know the school game, a world in which he feels the hostility and cruelty of people who have been comfortable all their lives.

One gifted student in Operation Hope commented that money to facilitate college was the most important contribution any project could have made to his life. No other Federal program operates precisely this way. Still, in attempting to help these students through college, the Operation Hope experience emphasizes how wide is the breach between rich and poor in America today.

Operation Hope

The staff and directors' offices at Operation Hope are open at all times for students, and a "hot line" telephone is maintained at night and on weekends. At least one staff member is always available to help with psychiatric emergencies, health problems, draft exigencies, or legal problems. If a staff member vanishes for several hours, or remains at his office until late at night, it usually means that a student is in a crisis. These students acquired adult problems before they entered college. One 21-year-old, for example, needed medical and legal counseling concerning divorce and the death of his 2-year-old child. Draft counseling is another important need. Since most of the men have jobs and families, they cannot finance the 30 hours of course time that would qualify them for student deferments. Thus, consultations and appeals to local draft boards are necessary staff functions. These students also need advice about courses, professors, and examinations. They require coaching in the techniques of studying, paper writing, and exam taking. All of these areas are routinely part of staff guidance.

These students had been so intellectually and emotionally starved that they devoured attention. None of them had enjoyed the kinds of family or social contacts that would develop intellectual curiosity. Indeed, most of them had such battered images of themselves they were afraid to ask questions in college classes. Many of them needed someone with whom they could discuss the Viet Nam War, the tax system, the meaning of the moon shot, or

racial discrimination. One student who began the program with a poor self-image, put it this way: "Now I can question, but I lack power, I've learned how to conform enough to get by. . . ." The staff, who are black, white, and Chicano, are by turns the surrogate parents, doctors, lawyers, philosophers, and companions to whom the students can turn.

Since students live in perpetual crisis, staff members know there will never be a weekend without its emergency, no night without a call from a panicked student. The services of Operation Hope span the gamut from counseling and financial assistance to aid in getting things done. This may mean calling a medical doctor, getting a family welfare check expedited, or getting a family member admitted into a hospital. Any middle-class person takes for granted that he can lift a telephone to accomplish such things, but these needs can become major crises for the ghetto person. The students needed these reality services, as well as step-by-step advice on how to dress, how to behave at an interview, and lessons in the social amenities, the things white students take for granted. They needed lessons in speech, training in group speaking. Many of them needed to learn how to write, to organize papers and express their ideas clearly. Because the campus atmosphere is cold and unfamiliar, the one comfortable place where all the participants could meet has been at classes offered by Operation Hope.

Campus lectures, particularly in the social sciences, have frustrated and angered these students. Often the courses seemed irrelevant or instructors offered opinions that sounded incredibly naive to the ears of these experienced, old-young men and women.

One of the important needs of the students was a sense of ethnic identification and history, and a forum where they could freely raise questions about universal social ideas. Courses in black or Chicano history are often badly taught in colleges. Indeed, these courses often are taught with a condescending point of view that insults the student who is attempting to learn about his own heritage. Consequently, such courses have been taught at the Operation Hope headquarters. During the fall semester of 1970, June Moore, of the UCLA School of Social Work, taught a course on the history and philosophy of social work institutions in the United States. The informality of such classes permits the students to interact with each other and with teachers in informal discussion and comradeship that is lacking in most of their lives.

Involuntarily most of these students are loners. During the seven-eight years when they are holding jobs and also studying, they are under unusual strain. They need the staff help in homemaking, in finding an apartment, buying a car or filing insurance. Many of

them have debts, often from the illegal claims of door-to-door salesmen.

The small "Hope" offices, with their modest library and open doors, provide a kind of home base for these students where they can "rap" with the staff, and admit their real feelings, or ask for help. It is the only such place in their lives. Not at home, at friends' houses, nor in school or clinics can they find support and assistance.

By contrast with the impersonal, bureaucratic schools, and institutions, the staff has an open-door policy which means nobody is ever too busy to see a student when he drops in. There is never a wait. Since the students are the point of the program, staff members are always on hand to help out, to talk, and to provide coffee and a snack. Students rely on this support particularly during exam periods, or when a term paper is due.

Living as they do, in two very separate life styles, the students are under extreme tension. As one Chicano put it, "This project is great but, man, am I having problems. For the first time I am learning to think, I listen and try to figure out what's being said. I'm so excited about hearing people, but I'm bored with my family. I'm finding my girlfriend a drag, we can't talk anymore. And the guys I know, well I haven't seen them in weeks. Man, is this lonely."

For ghetto students in the middle-class colleges the strain of a double life is continuous. There is an internal price they pay for living in two worlds. Part of the price may be in terms of physical tensions, anxieties, or general loss of self-confidence. Realistically, life is a daily struggle. In order to study, the ghetto student leads a tired and lonely life. As one man from Watts described his schedule, he attends school in the morning, works afternoons, sleeps in the early evenings, and studies all night, after his family goes to bed. He has no time or energy for close personal relationships. The stress is such that he must keep his feelings under control at all times. It is not surprising that he has a stomach ulcer. Many of the students in the project suffer from psychosomatic ailments although they are very young. Some have hives, or colitis, ulcers, or hypertension. A few suffer from insomnia, panic, and nightmares. When a student leaves the personal and familiar world of the barrio for the college environment, he leaves his status and sense of acceptance, and must adapt to a highly impersonal structure. He must be careful in his dress, guarded in his manner and speech. When he leaves campus he again returns to a wife (or a woman may return to a husband) whose standards and outlook are the antithesis of all that the campus represents.

To the average student on campus, the ghetto student seems of a different breed. Tough, street-wise, analytical, many of them have experienced jails, and brutalities that the other students have only read about. They have suffered hunger, exhaustion, and have seen their friends turn to alcohol or drugs. They have had to use cunning and muscle to survive. An affluent youngster arrives in college certain that theft and alcoholism are signs of weakness, inferiority. Neither students nor their teachers realize that the crimes they deplore may be the vehicles of survival in the ghetto. The kid who doesn't survive that jungle does not get to enter a project that will help him through college. A person who has not used his cunning to survive will ultimately despair, entering the no-mans-land of inertia and drugs. A ghetto student who seems angry, suppressed, cynical, and hard can only be understood if his armor of hostility and suspicion are also understood; young people who have lived in the ghetto or barrio for 20 years have developed defenses that allow them to cope with drug users, police harrassment, with rejections by schools, social agencies and hospitals. Most of them have needed to devise a hard surface, never revealing their feelings to anyone, never trusting anyone, always analyzing a situation for possible traps. Since they have had to hustle for money all their lives, they may be busy trying to beat the welfare system, or avoiding someone else's con game. Typically, as children, some of the students have been shifted from one foster home to another, in the manner of one girl whose mother was declared mentally incompetent. At age 5 she recalled being put to bed in a relative's house where, as she hugged the pillow, she found a gun. For her, school was a relief from washing, cooking, cleaning, and being beaten with a belt buckle arbitrarily. At 14, she and a friend were put in jail for stealing. Another girl was abandoned at the age of 14 and left alone in an apartment. In order not to be evicted she rented rooms, but when she tried to go on welfare to raise the rent money, the caseworker told her to throw a rent party and charge admission which could be used to pay the month's rent. Two weeks before high school graduation the girl quit school and worked at odd jobs for six years before anyone suggested that she had a good mind and might go to college. To the son of a migrant worker, an avid reader in a large family, the possibility of a college education seemed like the wildest of dreams as he worked in the fields year after year, missing months of school.

To classmates or outsiders these students might seem cool and brusque, with an appearance of self-confidence. Actually, they often live in a state of conflict that is bordering on panic. They know that they must be many times as strong, intelligent, and controlled as their peers in school, and that they are expected to

endure and prevail in a manner that would be impossible for many adults. Raised by television, these students have a sophistication that is underestimated by their peers. They know a good deal about the way they look to the other side, and they are familiar with the comforts of most Americans, with the social work jargon in which ghetto disadvantages are discussed, and they realize that they are put down for qualities that are really the product of their environment. They must survive in two worlds, and are expected to be idealistic when they are surrounded by despair and futility and to be willing to give some part of their lives to change a society that would not ordinarily give them a chance.

By adolescence most ghetto children have given up. They see no alternatives and no future. In the southern section of Central Los Angeles they are likely to turn to alcohol, while the eastern section they would more likely use drugs. Many youngsters between 15 and 25 try or actually do commit suicide. There is nobody to help them. Their families are disrupted. Teachers who have taught in these neighborhoods for 20 years, but who live elsewhere, do not even know the parents of their students. As one black student explained, high school students are never told that they have possibilities of further education. Typically, one student stated, "Nobody ever told me I was college material." One very able athlete, with honor roll marks, wasted two years after high school not knowing that he could have attended a tax-supported college without paying thousands of dollars. Scholarship offers had been made through his high school because of his athletic ability, but he had never been informed by his advisors. Another girl wasted six years in dead-end jobs because she similarly did not know college was even a remote possibility. Isolated from the information that every middle-income person takes for granted, and misled by their own schools, the best of these youngsters have a bitter tale to tell. By age 24 many of them say they feel 50. On a college campus this is no advantage.

Impact

The first most important impact of Operation Hope was the fact that the students were sticking out their difficult academic programs. Previously, when faced with crises they had withdrawn from college. In this project, bolstered by the staff, they weathered continual crises and managed to go on studying. Even success was not without conflict. One girl who had, with considerable help made a C in English, remarked, "Well, I guess this means I've given up. I'm conforming, the fight is over. I've entered the system—what can I possibly do to make anything better for myself or anybody else. I did what the instructor wanted and I passed; he

wasn't the least interested in what I am, what I feel, or what I want."

The students' marks have steadily improved and several began to be eloquent spokesmen, writing reasoned essays on the issues close to their hearts. Drug abuse is a topic on which these students have more than usual understanding. While the illegality of the drugs generates the crime for which they are punished, it seems clear to them that there is little concern for actually helping addicts; there are no adequate medical or community-based programs available. One of the students wrote:

"How rational would it be to appoint a doctor as a judge in a court of law? It would seem that this wouldn't be very rational at all, for although he might know medicine he would be quite unfamiliar with the mechanics of law. Taken in this light the question is raised: Why are administrators and law enforcement officials considered to be more knowledgeable in the area of a medical and social problem such as drug addiction?"

The participants are impressive people. Selected for qualities of leadership, they also have displayed considerable aesthetic talents. Many of them write excellent poetry, sing, and paint. Candid and cynical, they are at the same time deep and more idealistic. Although the men and women supported by the project have come from different homes, their stories are painfully similar. Most of them come from families on relief. In grade school they were demeaned by their teachers. They were often absent from school, and were arrested at an early age for some theft such as gouging nickles from a parking meter or for gang fighting. By 17 the "average" young man had been in a house of correction, may have gotten a girlfriend pregnant and have had to marry, spending a year or so washing cars or doing clean-up work in a factory. By age 20, they could see themselves at a dead end, with the odds stacked against them. Yet they had intense intellectual curiosity, and some inner stature that was not altered by the meanness of life around them. As one girl remarked:

"A long time ago I made up my mind I would rather die than to treat people as I had been treated. I knew what it meant to be disliked for nothing and always used. I suppose having compassion has been the only thing that has saved me from hating the world."

One Chicano student recalls being "busted" on a marijuana charge. When he appeared in court he was sent to jail, while a white kid on the identical charge was released. "Jail is a school where you learn many things." His experience in the army taught him yet more about discrimination as he watched some episodes of

mistreatment of the Vietnamese. Now, on his return, he had a mission, to create changes, and as a beginning he has been tutoring kids in an East Los Angeles Parole Center. His own image of his past life was succinctly expressed in a newspaper essay he wrote:

"I cannot help but bring up a thought that would enter my mind every once in a while in jail. I would picture myself as a person trying to learn how to swim (cope with every day life problems) in a deep, dark, cold sea (the Barrio), and finding myself submerging because of my inability to swim. Along comes a lifeguard (institution: rehabilitation) and pulls me up on the platform (institution) and shows me how to swim (rehabilitates me) and simply throws me back into the deep, dark, cold sea (Barrio) with little knowledge as to whether I had developed the ability to swim. . . ."

Although many of the students in the program came from disrupted or nonexistent families, a few have shown the stability that comes from tacit family support. A student from Watts, who has watched his friends deteriorate along the route of drugs and apathy, somehow manages to study while his family sleeps. He is lucky enough to have a family that is together. He also manages to continue athletics, coaching younger children in school subjects and basketball. He manages to live without close friends, without a confidante or wife, without time for himself. He works in the afternoon, sleeps until midnight, studies until dawn, and goes to school in the morning. When he finally has his credentials he wants to become a poverty lawyer. He has every reason a man could have to plan an escape from the poor, enclosed, drugged, hopeless world in which his life has been lived—but he is not content to do as many others have, to get his skills, "go make his pile" and separate himself. Another student who intends to be a lawyer, commented, "I don't look for big hopes anymore but I've learned I can do something and I'm not going to stop fighting."

These are the people who can provide community mental health services, legal aid and instruction from within their communities. These are the new people who are needed in the mental health professions. The attitude of these students offers some measure of the urgent need for change. One girl in the program, who had been quite upset, was asked whether she would like to see a campus psychiatrist.

"For what? I have had two of those, a psychiatrist and a social worker. One told me I had problems with authority when I was late for an appointment, so I came early the next time and was told I was too anxious. When I got the social worker, I tried to be exactly on time and you know what she told me? I was compulsive. How do you win with that kind of closed system? The only thing I could do is drop dead. They

had no awareness that I had no car, had to beg a ride most of the time, and had no money all of the time."

Another student told a conference of mental health professions and social workers, "You mean well, but you really can't help with the kind of problems we have."

Colleges and professional schools could alter this impasse by training low-income people and by developing techniques for working with the poor, instead of sending emissaries by day to help the poor adjust to being poor. By drawing professionals from within poor communities, social work and the mental health professions might promote community activity, participation in city planning, in education, and in the establishment of agencies for health care and housing. Such participation would enhance a constructive process of change that is a matter of ethics as much as money.

It has been estimated that some 200,000 youngsters who are in the top of the U.S. population (judged by ability) will never acquire the means to go to college. These are the potential leaders who could rage the real war against poverty. Operation Hope began with the idea that the selection and training of young leaders from the ghetto would offer a model for recruiting and educating a new kind of personnel in social work professions. These would be people who could inject the energy of personal involvement and reality understanding into helping professions such as social work.

In its short existence, Operation Hope has already shown that there are potential leaders within the ghetto, whose ideals and intellect could make them the agents of peaceful social change. The education of such people is difficult because it must compensate for so much: the students' lack of family, confidence, gamesmanship, academic skills, medical, psychological, and legal aid—in addition to money. No program to aid and educate potential young talents from the ghetto can realistically meet these needs, nor leave them to the universities and colleges. The ghetto environment so rapidly destroys trust and normal human emotions that the Operation Hope staff has begun to see that its program should begin with high school students. No person can cope with life and death crises in his family day after day and yet devote himself to learning, yet this is what is expected of the ghetto student. As early as possible, students should be relieved of some of the reality conflicts. In addition, paucity of funds leaves huge gaps in their education; unlike many of their peers they never had the opportunity to relate to man's universal problems through visual art, drama, or music. Most of these students have seen little of the world outside their neighborhoods. Yet, as periodic analyses show,

they are aware of the culture outside, and as their education has made them more perceptive, self-confident, and articulate, they are creating art of their own.

This program while only a miniscule experiment in the overall context of America today, has shown that a remarkable transformation can be made. It has helped to liberate a new kind of student. Because they have experienced more of life than most men of 50 when they arrive in college, these "youths" are not passive intellectuals. They approach the arts and social sciences with a personal sense of involvement and judgment. They do not merely accept; they question. If they are old in outlook, their minds are capacious. Their brains are young. They have vitality, compassion, motivation. The result is a kind of genius, a combination of wisdom and brightness, a depth that is not often found. Trivia will not distract them, nor will minor hardships present obstacles. They have a highly developed sense of justice, and an eagerness for history, and indeed, at 23 and 24, they resemble the idealistic young men of the American Revolution who, at the same age, were writing the Declaration of Independence and attempting to fashion a constitution. The qualities that have been elicited in these men and women include a kind of idealistic willingness to gamble on the future. Many young people have given up, and feel that the establishment will not permit changes for the benefit of the left-out Americans. The participants of Operation Hope have no certainty that change is possible, but they have committed themselves to try. With their nascent social genius they may indeed transform the helping professions from ineffectual stopgap procedures, to a realistic confrontation of the social problems behind individual ills. They may infuse new creativity and strength into the mental health professions by entering as a new kind of professional—one who is fearless rather than cowed, analytical rather than sentimental, one who is undeluded about the detailed nature of the ghetto and incapable of forgetting its manner of shaping people. Unlike many social workers in today's professional schools, these people will be able to function in the poorest levels of society as well as among middle-class professionals. They will be able to offer the kind of innovation that stems from understanding where one started and what one's ends are. If their affluent classmates are currently unsure of where they are going, these students are seizing their intellectual honing as a liberation, for this is the only way out of the real hopelessness in which they have lived. The template offered by Operation Hope is there to be extended and copied throughout the country.

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How the Social Organization of Animal Communities Can Lead to a Population Crisis Which Destroys Them

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The world-wide population explosion gives added interest to Dr. John B. Calhoun's studies of the population and social organization of animal communities. An animal ecologist by training, he has moved from studies of mice and shrews in the field to increasingly controlled laboratory environments. He has pioneered the use of artificial habitats for entire populations of mice or rats, in which the effects of over-population over several generations can be telescoped for all to see, as in a time machine.

An experiment now in progress makes these effects all too clear: As over-population disrupted their social organization, the mice in his enclosed habitats have sunk to sexual deviation, cannibalism, pathological withdrawal, inability to rear young, and even inability to conceive. Although they remain physically healthy, they are now so mentally ill that they seem unlikely ever to recover.

Following the individual careers of generations of animals is a time-consuming and complex task. The present experiment, for instance, yielded over half a million separate observations for which the animals had to be captured and identified at regular intervals. The potential of such studies has just been vastly increased by a new technique developed in this Lab: a system of implants and portals hooked up to a computer. By placing these portals next to several types of behavior monitoring and training devices, Dr. Calhoun and his colleagues can now record continuously much of the behavior of all members of a group. By analyzing the computer records, they can learn who is doing what with (or near) whom, where, at what time, and for how long. Since such facts are recorded automatically, the investigators are freed

to devote their own visual observations to nuances of behavior that might otherwise escape them.

For the past 30 years, half of which he spent at NIMH, where he is chief of the Laboratory of Psychology's Unit for Research on Behavioral Systems in the Intramural Research Program, Dr. Calhoun has been investigating how space is used by mammals in the wild and in enclosed areas. He has made arresting connections between his experimental work with animals and his view of the human condition. He believes that mankind has only 15 years left in which to take the steps that are essential to prevent the end of evolution on this planet.

We are all descended from species in which each individual leads a relatively solitary way of life, interrupted by occasional contacts, Dr. Calhoun notes. As he learned from his early field studies, such species reproduce sufficiently to fill up the space between home points, until the population reaches an equilibrium in which all space is utilized in a uniform manner. At such a time, the distance between the homes of neighbors becomes approximately two-thirds of the diameter of the range of any individual, and thus there is some overlap of range. This results in social bonds between groups of neighbors, who begin to form loose clumps of about a dozen animals each. "Numerous examples where N_b (the optimum or basic number for a species) approximates 12 adult individuals may be found in most orders of mammals, including the primates," he writes. "Data from culturally primitive gathering peoples strongly suggest that man emerged through such a lineage. I further suspect that modern technological man still bears the yoke or wears the diadem of an $N_b=12$."

In their native habitats, approximately 12 rats will inhabit each burrow system. Wherever the basic group size of mammals becomes much larger than 12, it results from something in the environment—usually a marked spatial restriction of some needed resource—which conditions them to associate the presence of others with, for example, feeding or drinking. Gradually the animals come to need and seek out the presence of others even when it is no longer necessary, or when it works to their detriment. The new social behavior which results can have a catastrophic impact on the species' population.

When animals live in their native habitats, it is difficult to follow the history and behavior of individual animals, as Dr. Calhoun wished to do. Therefore, when he joined the staff of the Johns Hopkins School of Hygiene and Public Health's Rodent Ecology Project in 1947, he constructed his first artificial environ-

ment in order to control at least some of the variables and to keep track of individual rats. The Project's main concern was rat control, at a time when poisons had been found wanting. Block by block treatment with ANTU in the city of Baltimore had regularly reduced the rat population by 50 to 85 percent—but within 15 to 44 months, the population would recover and return to its original level. Clearly each city block maintained a stable population level. But why? And why did this level persist, without increase, even though extra food was available in open garbage cans and additional burrows might have been built in the available space?

To test his hypothesis that population growth was inhibited by the rats' social interaction, Dr. Calhoun built a pen modeled after the environment the rats encountered in a typical Baltimore "row house" block. It enclosed roughly one-quarter acre, an area big enough for several local colonies of rats, and small enough for an observer in a 20-foot tower just outside the pen to observe all the rats with 6-power binoculars. A rat-proof fence guaranteed that no rat could escape from the pen. An electrified barrier fence several feet away, plus a series of traps, kept all predators out. Food and drink were plentiful. Each rat was permanently marked by means of fish tags inserted in its ear-lobes. In addition, it could be identified by sight through a system of pelage markings: spots of hair were removed from the heads of females. The system provided 43 different combinations for each sex.

The colony was started with five pairs of wild Norway rats chosen to be as genetically similar as possible. They were trapped in February 1947 on Parsons Island, a 150-acre tract in Chesapeake Bay which had been cut off the mainland since the turn of the century. Since their population had fluctuated widely, leaving fewer than 150 rats on the island, it was expected that they would have reached considerable homozygosity by that time. Therefore, the variability of results from the experiment could be attributed to environmental conditions, rather than to hereditary variability among the rats. The whole experiment was set up in a partial clearing near Towson, Maryland, only a hundred yards from Dr. Calhoun's home—an essential factor, since rats are nocturnal animals which could best be observed just before daybreak and at dusk, plus on chosen occasions at night with the aid of 2,000-watt lamps, thus requiring extremely irregular working hours. During April and May of 1949, the U.S. Army Signal Corps made extensive films of the project.

These rats and their descendants were followed for 27 months. Almost immediately after the start of the colony, class differences appeared. The heavier, hardier, dominant rats, who were also the most successful at reproducing, lived in the Southeast part of the

pen. Only three animals survived from the litter born on the Northwest side of the pen; their growth rates, as well as social status, were clearly inferior to those of the 13 surviving members of the Southeast litters. This class structure was maintained throughout the entire study. As the population increased, however, some males from the higher-ranking Southeast migrated to the Northwest. There was no upward mobility—all changes in social status were downward. As the Northwest filled up with males, all social relationships in the area became increasingly unstable. Estrous females would be pursued by packs of males and mounted several hundred times a night, to their considerable distress. They stopped building nests and burrows, conceived less often and raised fewer young. "At one end of the social spectrum there was a colony consisting of a single dominant male and a harem of 13 females, most of whom were reproducing successfully," writes Dr. Calhoun, describing the Southeast aristocrats. "At the opposite extreme there were all-male aggregates whose members rarely engaged in any sexual activity." He judged social rank on the basis of success in combat, size, place of birth, migration, reproductive success, and associates. The social rank dictated when the rats would visit the single central source of food and water (upper-class rats maintained the twice-nightly schedule that had been characteristic of the whole colony in its early days when the population was low, while lower-ranking animals were more active at dusk and dawn, when they would be least likely to meet their superiors). The characteristic behavior of lower-ranking rats was to avoid coming close to a dominant rat.

Eventually, each major goal, such as a burrow or a site for procuring food, became connected by trails that were kept free of vegetation. After a while, however, no more trails were established. "Expansion of the meshwork of trails was limited by some response which precluded the minimum diameter of the polygon enclosed by a group of trails becoming less than 5 feet," notes Dr. Calhoun. "Once the pen became filled to this extent, further increase in the number of rats merely increased the frequency of contacts between rats inhabiting the same locality." This meant that the lower-ranking rats in the Northwest would have more contacts with other rats, a factor which seemed to inhibit their growth. Their reduced growth, social instability, lowered reproductive ability, and higher infant mortality acted together to limit the rat population, despite the absence of other controlling factors. The population was thus held down to 200 adults at any one time.

"The number, 200 rats, is particularly instructive when we compare it with the number of rats that might have been raised in the

available space had each individual been isolated as a juvenile into 2 square feet of cage space, as is customarily done in the laboratory," points out Dr. Calhoun. "Under such laboratory conditions, 5,000 healthy rats might have been reared in 10,000 square feet of space instead of the 200 which utilized such space under free-ranging conditions. . . . The obvious explanation is that under free-ranging conditions the rats expressed genetically determined and culturally modified behavioral potentialities which would be impossible under caged conditions. This explanation has broad implications. Whenever the density of a population becomes increased beyond that level to which the heredity-to-environment relationship provides optimum adjustment, then the individual and the group must forfeit some of their potentials of behavior if all members are to maintain an adequate state of health." Clearly the social use of space vitally affects our well-being and must be taken into account, together with our needs of space for food and for shelter.

The study spanned four generations of rats, and the analysis of their social relationships took several years. The resulting 288-page report, prepared with facilities made available by the Walter Reed Army Medical Center and the National Institutes of Health, was completed in 1956 and published in 1962. It showed that social interaction can inhibit reproduction and bring about the control of population density. It also opened up a new field of research: the relationship of the physical structure of the environment to social behavior, and to the social organization of groups.

In retrospect, Dr. Calhoun thinks that one of the study's most interesting findings was its evidence that animals in crowded situations—at least species as advanced as the rat—can develop a class structure that will protect a portion of their members. "When there is no space to escape in, some small portion of the population will remain in an optimal situation, at the expense of the rest of the population," he says. "In this way, at least a few animals can continue with what is essential for the species' survival." With rodents, this would be the ability to reproduce themselves biologically. With human beings, he believes the issue is primarily the production of ideas. However, the rats' survival was achieved at terrible cost to the majority.

Another important finding, not highlighted in the study but increasingly interesting in retrospect, was that some degree of social pressure and personal disorganization was required for creativity. The most creative act that he observed throughout these four generations of rats—something akin to the discovery of the wheel for man—came from a highly disorganized group of males who had lost all ability to court females and were not even

able to repair their burrows. Normally rats clean their nests, repair their burrows, and keep these burrows connected to others in an underground network. These rats, however, withdrew from the larger social organization. As they did, and the social pressure on them was relieved, they had the opportunity to reorganize their behavior into new patterns. One thing rats normally do from instinct, without having to learn it from other rats, is to construct a burrow by digging up some dirt and pushing it out. Occasionally some rats will make little wads of dirt and carry them out. But when these rats decided to build a new burrow, they did a remarkable thing: they took 40 to 50 wads of dirt, made a ball of them underground, and then rolled it out most efficiently. Since it happened underground, Dr. Calhoun never saw how they actually did it. But he did see the result, a large ball of dirt neatly rolled out near a freshly-dug burrow. The rats must have become aware of the efficiency or advantage of their discovery, for they perpetuated this method in later excavations of their burrow.

"We must be very careful about what we call mental health," concludes Dr. Calhoun. "If man is unique, it's the result of his ability to develop new ideas; yet perhaps these can only arise in a social milieu that represses him somewhat, leading to deviant behavior and a disorganization which allow him to re-organize in new ways after the social pressure has been withdrawn. These ways may or may not be creative (in the sense of adaptively constructive), but they'll be new. Human beings thus face a predicament: If we try to make everybody totally happy, we'll destroy mankind. So the criterion for mental health might include some unhappiness and frustration. Perhaps our goal should be not to let these deviant individuals go too far, but give them a chance to re-organize their behavior."

After his study of the wild Norway rats in a quarter-acre enclosure, Dr. Calhoun moved into the laboratory to further increase his control over his animals' environment. This time he used standard, domesticated white Norway rats and ran two series of experiments, each of which was done in triplicate. Domesticated rats can stand more crowding than wild animals. In each case the population of the habitat was allowed to reach about twice the optimum size for that space. By removing several litters, Dr. Calhoun artificially structured this population to have only three generations of adults. Each experiment was carried out in a 10 x 14-foot room, and each colony was followed closely for 18 months, to observe the effects of population density on the rats' social organization.

Deliberately, in the first series of experiments, Dr. Calhoun produced a pathological "togetherness" through his design of the

rats' pens and food hoppers. Each room had four complete dwelling units (drinking fountain, food hopper and elevated artificial burrow, reached by a winding staircase and holding five nest boxes) or pens, with comfortable space for a colony of 12 rats. However, the pens were so arranged that pens 1 and 4 were dead ends; to reach them, the rats had to go through pens 2 and 3. Two ramps led into these central pens, while only one ramp led into each end pen. These physical arrangements immediately skewed the mathematical probabilities in favor of a higher population density in the central pens. The design of the food dispensers also had a major impact on the rats' social behavior: because the circular hoppers were covered with wire mesh, the rats had to nibble at the hard pellets for a long time, through the mesh, making eating a lengthy—and inevitably social—activity. At the same time, the population in each room was allowed to grow from its 32 original settlers to 80 rats (at the basic group size of 12 rats per pen, it should have been no more than 48).

The result of these arrangements was what Dr. Calhoun calls a "behavioral sink." When water and organic matter collect in natural depressions, without drainage, they form stagnating, marshy sinks from which the water may gradually evaporate. Similarly, the biological resources of living creatures may become dissipated in a sort of sink. The rats' behavior in the first series of experiments formed such a sink, since it prevented the animals from realizing their life potential and aggravated whatever pathology could be found in the group.

As expected, more rats lived in the middle pens than in the central pens. However, the difference between the density of these pens soon proved unexpectedly great. As the rats developed the "tradition" of eating together, non-resident rats flocked into the central pens to feed. Sometimes as many as three-quarters of the whole population would be feeding in a single pen at any one time. And at that point, the process became a vicious circle. Seeing so many rats at the hopper in one of the middle pens, the rats that were eating at other hoppers abandoned theirs and also joined the crowd. By the time the three experiments in the first series drew to a close, half or more of the populations were eating and even sleeping in the same pen.

Ever since Thomas Malthus wrote about the ultimate natural limits on population growth—vice and misery—most of the attention has been given to misery. Researchers have been concerned with the problems of food supply, disease and predation, notes Dr. Calhoun. But what about vice?

Vice, in the sense of abnormal or life-destroying behavior, can be found in large quantities in a behavioral sink. It appeared most

dramatically among the females in the first experiment. First their nest-building became careless and inefficient, threatening the safety of their young. Though rats of both sexes build nests, females usually do it most vigorously around the time they give birth, seeking out appropriate materials, carrying them bit by bit, and working in a sustained manner to arrange them in a cuplike depression. In the overcrowded pens, the females were interrupted so often by the many rats they met along the way that they began to make the nests too flat, or incomplete. During the later months of the experiment, they stopped building any nests at all and simply bore their litters on the cold sawdust floor. They lost the ability to carry their young away from danger. Normally, when a rat mother is alarmed, she will pick up her pups by the scruff of the neck and take them to safety. In the absence of a ruling male in the central pens, such alarms were frequent, since hordes of males might invade the nesting boxes in pursuit of a sexually receptive female who had temporarily taken refuge there. However, these mothers soon became unable to see the task through. "They would move only part of their litters and would scatter them by depositing the infants in different places or simply dropping them on the floor of the pen," writes Dr. Calhoun. "The infants thus abandoned throughout the pen were seldom nursed. They would die where they were dropped, and were thereupon generally eaten by the adults."

Under these circumstances, the infant mortality was disastrous—it averaged 96 percent. The females themselves suffered from an unusually high rate of disorders of pregnancy and delivery. Among the founding population of these central pens, four females died for every male.

"Among the males, the behavior disturbances ranged from sexual deviation to cannibalism, and from frenetic overactivity to a pathological withdrawal from which individuals would emerge to eat, drink and move about only when other members of the community were asleep," reports Dr. Calhoun. Everywhere the sex ratios were askew: some groups might have seven females and one male, while others had twenty males and ten females.

While vice prevailed in the central pens, a curious thing occurred in the two end pens: after a while, a single dominant male would gain control of each pen and keep out all male challengers. Again, this was a result of the social eating habits fostered by the slow-yielding food hoppers. Like most of the rats in the experiment, the lower-status rats went to the central pens to eat there in company, rather than have lonely meals in their own pens. However, they chose to go at a time when the more dominant rats were not likely to be there—in the early hours of the

morning. If they happened to live in one of the less-crowded end pens, this meant that by the time they returned after feeding, the dominant males would be awake and ready to fight at the base of the single ramp that led into the pen. After a succession of defeats, the lower-status rats would abandon all effort to return to their home pens. Instead, they migrated to the central pens and added to the congestion there. The dominant male did not mind females, however. Soon he acquired a "harem" of seven or eight females who could come and go as they pleased, but could always count on a safe place to retreat to when they were in heat and wanted to escape the excessive attentions of the hordes in the central pens. It was also a haven in which to raise their young. "Of the various social environments that developed during the course of the experiments, the brood pens, as we called them, appeared to be the only healthy ones, at least in terms of the survival of the group," declares Dr. Calhoun. "The harem females generally made good mothers. They nursed their young, built nests for them and protected them from harm. If any situation arose that a mother considered a danger to her pups, she would pick the infants up one at a time and carry them in her mouth to a safer place. Nothing would distract her from this task until the entire litter had been moved. Half the infants born in the brood pens survived."

In the central pens, no males could establish themselves as leaders of a group for any length of time. A goodly number became homosexual or pansexual, making indiscriminate advances to males, juveniles, or females that were not in estrus. Another group—"the beautiful ones"—became completely passive and withdrawn, though sleek and unscarred; they ignored all rats of both sexes and were ignored in return. A third group, "the probbers," became hypersexed; apparently uninterested in the status struggle, they lay in wait for estrous females and pursued them relentlessly, without benefit of the normal courtship ritual. Though normal rats follow a female to her burrow and then lie quietly outside until she comes out to accept them, these animals would violate the burrows and attack any accessible female. They were also homosexual, and in time many of them became cannibalistic.

The disruption of behavior in the second series of experiments was similar, though far less severe. No behavioral sink developed. The rats' food was powdered and set out in an open hopper, where the rats could eat quickly and run. A slow-yielding drinking fountain did turn the animals into social drinkers, who drank only when other animals were also lined up at the fountain; but since rats generally drink as soon as they awake, the effect of this was

to keep them in the pens in which they slept. Nevertheless, 80 percent of the infants in the middle pens died. "It is obvious that the behavioral repertory with which the Norway rat has emerged from the trials of evolution and domestication must break down under the social pressures generated by population density," concludes Dr. Calhoun. He adds that "we all live in pens, in compounds that close us in." And as the population increases, there will be no place to escape.

What would life be like in a static Utopia from which there were no escape? In June 1968, having started a new Lab at the NIMH Animal Center near Poolesville, Maryland, Dr. Calhoun established a closed universe for mice with plenty of food, water, and space. It was a large square enclosure in the building's loft, divided into 16 interconnected cells, each of which contained a 16-unit living complex that could house over 200 mice. Socially, however, the optimum population was 8-12 adults per cell, as the mice demonstrated when they began forming stable social groups of this size in each cell. Social space is not measured in feet or yards, nor in physical resources—it has to do with the number of interactions between individuals in the space. To avoid an excess of interactions, the mice's required social space was thus roughly 20 times larger than the space necessary for biological sustenance in this environment.

By the time the first 150 mice stemming from the four colonizing pairs reached adulthood, all the social space was filled. The total population, including pups, was then 600, split into 14 social groups. When the next 450 younger mice alive at that time began to mature, they had no place to go socially. They tried, but the older males defended their territory and the youngsters lost out. Soon they began to withdraw socially. The rejected males either became recluses or formed large, motionless aggregates in the most exposed public space, farthest from the housing units. The rejected females assembled in the housing units that were farthest from the food and water. Meanwhile, the females in the settled social groups were still pouring out young, and this new generation never had a chance to grow up normally. The slow-yielding food hoppers aggravated the situation, creating several behavioral sinks. The mice's pathological need for togetherness soon generalized to drinking and sleeping, as well as eating. They began to pile up one on top of another so heedlessly in a few of their resting places that some mice actually suffocated, while one fifth of the living units remained vacant and many more contained only one or two mice.

The population as a whole went through four distinct phases in

its nearly three years of existence (the equivalent of over 100 years of history of man):

1) Strive: a period of colonizing and territorial establishment among the eight original mice, during which conception was suppressed as a result of the intense fighting among the males.

2) Exploit: A period during which the available space was exploited by social groups and the population doubled every 60 days, until the social space became filled with 150 adults and there were 450 additional socially immature mice. Once the social space was filled, the utilization of resources became more unequal. Several behavioral sinks resulted.

3) Stagnate: A time during which the rate of population growth markedly declined even though 1,600 more young were weaned. These young could not fully develop because they did not have enough social space. Maternal behavior and ability to conceive deteriorated.

4) Die: A direct route to extinction. Although some older females still conceived, they did not rear their litters, and the population began to decline at 2,200 as the older animals died. Behavior that is compatible with survival of the species had been blocked.

The experiment is presently in this final phase. "Only a few inadequate vestiges of territoriality remain," says Dr. Calhoun. "All capacities for developing and maintaining social bonds are disappearing with the last group of animals born. These are mostly beautiful ones, unstressed by normal tendencies for sex and aggression, and they cannot learn. They're all washed out." The mice no longer bury their dead, as they used to. Whatever mating behavior remains is down to the amphibian level—the male mounts the female but ejaculates outside her. And there have been no surviving young for a whole generation's time—since March 1, 1970. The only possible future seems to be that the population will go down to zero. The projected mortality predicts a decline of the population to 1,000 by November 1971. By this time, the youngest female will be far beyond menopause, and the population will be still too large to permit recouping of normal behavior, even were the survivors young enough to reproduce.

When a few mice were taken out of the habitat at its peak density and placed in normal uncrowded environments, they recovered only minimal amounts of aggression, sexuality, and social organization. The only animals that have been "cured" so far are a handful that were put in a sort of solitary confinement for two months (the equivalent of six years for a human being), after which they seemed able to start life all over again, as if reborn.

Originally this experiment consisted of five universes of different sizes, each one colonized with the same number of mice—four

pairs. One unit was half the size of the existing habitat, the next one four times smaller, the next one eight times smaller, and the smallest was only 1/16th the size of the current habitat. The purpose was to study the impact of colonizing density on later population growth. This was of interest because of some research done by Dr. Alexander Kessler, a geneticist who wished to study the effect of crowding on natural selection. Working under the guidance of Dr. René Dubos, he had produced a surprising effect which is now known as the "Kessler phenomenon": uninhibited reproduction of mice in a very small space, until they reach a point where there is standing-room only. Starting with 16 times the population and one-fourth of the space anyone else had ever worked with, he soon had thousands of mice that continued to reproduce with far less interference from crowding than anticipated. These unusual results contributed to Dr. Kessler's decisions to join the World Health Organization in Geneva to work on the human population problem.

Since the Kessler phenomenon contradicted the insights from most other experiments on rodent populations, Dr. Calhoun wanted to find out what caused it. By varying the size of his mouse universes while keeping the number of colonizers constant, he varied colonizing density. He hypothesized that the lower the colonizing density, the more intensely territoriality would develop: A mouse moving through space alone would identify more strongly with the components and configurations of the physical environment and have a larger personal space. Then, the more effectively mice exhibited territoriality, the greater would be the stress experienced by the later-born as they tried to find a niche in the social space. As a result of the stress, fewer females would conceive, and fewer of the young would survive to weaning. Indeed, the results did substantiate this hypothesis: the smaller the original space, the higher the density of the habitat before the population began to decline. The smallest habitat reached a density of 185 mice per cell before this happened, while the largest had a maximum population averaging only 137 mice per cell.

Despite these differences in maximum density, the pattern was the same in each universe. Density increased far above the optimum, to a point where no young born survived. After this high density had continued for a while, sexual behavior became so disorganized that no females conceived. The last 50 percent of the young which did survive had their behavior interrupted so frequently that they were never able to develop normal sexual, maternal or aggressive behaviors. Finally none of the mice were able to behave in the ways essential for the population's survival. As senescence and mortality set in, the population slowly began to

decline in size. By the time all survivors reached adulthood and the colonies were terminated, the indications were that all members would eventually have died with no further reproduction.

The history of man, like that of a mouse population, is marked by definite phases, Dr. Calhoun believes:

1) Strive: During 100 million years, the mammals of man's lineage, including early man, filled up the available space with socially effective groups. Each doubling of the population took an equal amount of time. Each successive species increased in awareness and responsiveness to the environment. Mankind reached a population of about 4.4 million some 40 to 50 thousand years ago.

2) Exploit: In the past 43,000 years, man has become truly human, set apart from all other animals by his discovery of "conceptual space," the pool of information from which new ideas are derived. This new kind of space has allowed him to escape from the constraints of physical space and natural resources. It has allowed him—so far—to avoid the period of stagnation after all the social space appeared to be used up.

"In physical space, when a little band of hunter-gatherers is confined to so many square miles, its adult members will have meaningful relations with only about 12 others each day," explains Dr. Calhoun. "If the population in the area doubled, they wouldn't have enough food; they would also have too many social contacts to handle. But generating ideas does two things: it develops roles to cut down the number of social interactions, as if segmenting this higher density; and it improves the machinery for mining resources. As people are linked together into an information network, they become increasingly efficient at creating more information."

This is the essential definition of man, he says: a species with spreading information networks and a population that grows increasingly rapidly.

The discovery of conceptual space led to a situation in which each doubling of the population requires half the time of the previous doubling. It took 20,000 years for the first doubling, but only 40 years for the present one. At this rate, the population would double in five years by the year 2005, and even faster thereafter—a mathematical impossibility. Clearly this growth must come to a stop before the point of no return, which is somewhere between the years 2010 and 2030, or only 40–60 years away. Dr. Calhoun believes that the world population must begin a continuous and slow decline after attaining a total adult population of 3.5 billion, if the cultural evolution of man is to continue. To achieve a sufficient decline soon enough, the change toward a reduced rate of reproduction must be well under way within the

next 15 years. Because of the unbalanced age structure of the population, there will be periods of time when the average female will have to limit herself to no more than one child.

Very shortly, too, the entire world population will be bound together into a single, complete information network. With every quadrupling of the world population, the geographical area covered by information networks has increased so as to double the potentiality of the individual and the diversity of his products. As long as the network was being pulled together, a larger population served a real function. But if present trends continue, the network will be complete just before the time when the population would reach the point of no return. Thus, the two processes that now characterize man will come to an end.

"We are rapidly approaching the main crisis in total evolution," says Dr. Calhoun, "not just man's evolution, but the total evolution on this planet. Nothing else any more is evolving without man's interference, through DDT or other means. It's a needle that we have to pass through within the next 15 years. Either we dedicate ourselves to making it through to something beyond, or else we don't make it—and there really is no beyond."

Making it not just physically, but with continued expansion of man's potential, will require more than a reduction in population growth. Besides fewer people, it will require developing new information prostheses to link these people's brains to a common pool of information, as well as to each other. Computers are only the beginning.

Meanwhile, Dr. Calhoun is taking advantage of new techniques developed in his lab which give researchers far more flexibility and accuracy—improvements of several orders of magnitude in data acquisition—while eliminating much of the tedium that animal observations previously required. Small "passive resonators," each one with a slightly different configuration, are implanted under the abdominal skin of rats to identify them. Twenty or more electromagnetic field portals are placed in each experimental habitat and hooked up to a computer. Then, every time a rat goes through such a portal, it leaves a record of its passage.

With the help of an expert in particle physics, Dr. Calhoun plans to study how rats move around their social field, and how this movement changes when the size of the group increases. He also wants to study how cooperation or noncooperation can be taught. He intends to regulate the access to food and water so that some places require two animals to work together, while others penalize such cooperation. He can even select which animals will be allowed to collaborate with which—for instance, create two sub-groups and forbid collaboration across these sub-groups, to see

how far the division would generalize to the animals' social structure.

In addition, he plans to renew his investigations of the effect of Vitamin A, begun in 1960-62. Vitamin A can produce behavior remarkably like that of "the beautiful ones." Even a small increase in Vitamin A in a rat's diet—from 3 to 12 units per gram of food—will act as a sort of tranquilizer, producing bland individuals who are less capable of courtship, aggression, or maternal behavior. Yet some human beings now get an equivalent amount of Vitamin A through supplements in milk and other foods. The amino acid tryptophane, on the other hand, seems to have the opposite effect, making animals more socially active and more aware of their surroundings. In 1960-62 Dr. Calhoun did pilot studies with tryptophane loading in rats as a follow-up of an earlier study by Drs. William Pollin, Philippe Cardon, and Seymour Kety of NIMH, who had shown that tryptophane increased the appropriateness of mental patients' response to other people.

These plans indicate that Dr. Calhoun still hopes man will decide on a rational evolutionary design, and will survive. Judging by his experiments, we are faced with three choices:

- 1) The way of the wild rats, who survived by maintaining a healthy way of life for a few aristocrats and allowing a few misfits to be creative—while so disrupting the behavioral capacities of the majority that they were unable to reproduce, thus keeping the population stable numerically.

- 2) The way of the domesticated rats and mice, whose population grew wildly until no young could develop the traits needed for survival, and it was too late. They were doomed to perish.

- 3) The way of increased human potentiality, with population growth stopped and the production of ideas multiplied. This is the only rational way out of the present crisis.

Either way, the course of man for thousands of years to come will be fixed within the next 50 years.

Intramural: NIMH

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San Francisco Westside: A Community Mental Health Center Serves the People

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Introduction

Since its emergence some two decades ago, the community psychiatry approach has come to be a dominant influence in the field of mental health. Conceptually, its focus is on a specified community and its goals are to prevent mental disorder and to promote mental health in all individuals of the community. In practice, a multidisciplinary group of caretakers assumes responsibility to provide a program of mental health care relevant to the needs of all residents without regard to their individual ability to pay. The program is comprehensive; thus, it includes all intensities of care—e.g., hospital inpatient, clinic outpatient, day treatment—within a spectrum of service elements that cover the range from prevention and early casefinding to rehabilitation of the chronically disabled. Delivery of services is coordinated to assure continuity of care and, ideally, all services are located inside the community's geographical boundaries.

These concepts and practices contrast sharply with those of the traditional approach, which the community psychiatry movement sought to reform. The traditional focus is on individuals who are diagnosed as ill. Both the locus and the quality of care is determined, in large part, by the ability to pay. Thus, those who can pay the full fees of practitioners and institutions—so-called private patients—seek out the services they need and find them either in their home communities or elsewhere. Then, depending on their ability to pay (e.g., to finance a trip to a distant city where the most expert treatment may be had), they might receive the best possible care. On the other hand, so-called public patients—which

is the label attached to those who cannot afford private fees—have to rely on the nearest public-supported services, wherever they might be located; depending on the circumstances of where they lived, then, they might receive a quality of care widely judged to be grossly inadequate. Further, the traditional approach has no program in the sense that community psychiatry has. It simply evolved and came to flourish, without conscious planning, over the past century or so.

The proponents of community psychiatry wanted to change the traditional approach because they felt it resulted in a grievously ineffective, inefficient, and inequitable patchwork of services. As one group of mental health leaders described it: “. . . services to the mentally ill have been sometimes multiple, sometimes overlapping, sometimes nonexistent, and always fragmented.” A few years ago the community psychiatry movement was considered to have launched a “third psychiatric revolution,” comparable in importance to the first revolution of ideas which began during the mid-18th century and led to a series of humanitarian reforms, such as freeing the insane from enchainment; and to the second, which began with the work of Freud.

These efforts, as noted above, have paid off handsomely. With the passage of the Community Mental Health Centers Act of 1963, the basic principles of community psychiatry became official public policy. In that, and in the subsequent legislation of the Community Mental Health Service Acts, Congress made Federal funds available to local communities for the creation of centers providing comprehensive, locally-based services to all community residents. Congress recognized that, even taking into account the known limitations of professional capabilities, there existed an enormous gap between the best that might be done and what actually was being done for the mentally ill. The lawmakers, therefore, stressed the central importance of cooperation and coordination. A key section of the Federal regulations states: “It cannot be overemphasized that the community mental health center movement seeks to accomplish comprehensive services not by duplicating or replacing existing services but rather by coordinating and improving what now exists and filling in gaps.”

As envisioned by the lawmakers, a center was to be a system not just a place. Creation of each system was a direct challenge to all the mental health caretakers in each of 2,000 “communities” across the country, which Congress designated along geographical lines (catchment areas). It challenged them to reevaluate their traditional autonomy regarding who they care for, how they are paid for their services, how the services are delivered. In effect, it called for them to give up their traditional ways if they wanted to

build a mental health care system responsive to the needs of the total population. Actually, it was to the private sector of the mental health establishment that the challenge was primarily directed, for most of the locally-based mental health programs in existence at the time were operating from private resources (albeit true that, directly and indirectly, through myriad channels, Federal and State money had been flowing into the private sector for many years previously at an even greater rate than it does now). Nevertheless, the challenge was meant to be heard throughout the establishment and—equally important—throughout the community. Leaders of every facet of community life were being called upon to work with members of the mental health establishment, particularly in making known the needs of all the community's people. Thus, creation of a center required that the mental health establishment, in its public and private sectors, and the community at large together share both the policy-making power that the newly available funds represented and the responsibility entailed in building a new health care delivery system.

This report is about the Westside Community Mental Health Center, Inc., of San Francisco, a consortium of 16 private agencies serving residents of the Westside catchment area, one of 5 in the city. It tells only a part of the story, mentioning mainly what seems germane to a theme of community psychiatry. It includes a brief history of origin and an account of growth and current program of services. The next section looks at center administration, funding structure, and policy-making machinery, and the following section describes the center's response to a community mental health crisis. The report ends with a look at the evaluation research the center now has underway.

Getting It All Together

The boundaries of the westside catchment area enclose an extremely diverse portion of San Francisco. Its neighborhoods range from the elite and fashionable to the slum ghetto, and their names evoke images of the city's past and recent history—e.g., Cow Hollow, Buena Vista Heights, the Marina, the Fillmore, and Haight-Ashbury. Correspondingly, the socioeconomic range of its 165,000 residents runs from substantive wealth to demeaning poverty. The people who live there constitute a racial and ethnic cross-section of San Francisco's famously cosmopolitan population. While a majority trace their descent from white European families, about one in four are black African in origin, and a sizeable proportion have Oriental backgrounds, notably Chinese, Japanese, and Filipino. A small fraction have Spanish surnames, and there are even a few original Americans living there.

The area covers about 7 square miles of urban terrain and includes a huge U.S. Army base, the Presidio. For the information of those who know the city, the Bay and the Ocean mark the area's northern boundary and U.S. highway 101 (Van Ness Ave.) the eastern; the streets defining the south and west borders are Market and 17th Streets, Stanyan and 6th Avenues to the Presidio.

Luckily, a large number of hospitals and psychological and social service agencies are located in the area. Indeed, most of the city's private hospitals with psychiatric programs are located there, as are most of its social service agencies, halfway houses, and free-standing psychiatric clinics, and many of its drug-abuse treatment programs. Several are well-endowed institutions with long and honorable traditions of providing the highest quality of care. Among them, for example, is Mt. Zion Hospital and Medical Center, which has long been highly regarded for the excellence of its training and research in psychiatry.

As originally designated, then, the district that was to become the Westside Mental Health Community was composed of a dozen or more disparate subcommunities bound through ties of race, cultural roots, economic status, and the like. Moreover, these subcommunities were cut off from one another—separated by barriers, as it were. For instance, a substantial proportion of the area residents were not eligible, for economic reasons, for the mental health care provided in their district. In order for the area to become a mental health community, such barriers had to be dismantled and a new network of ties created. It was in October 1966, following several weeks of informal talks, that a group of Westside institutions felt ready to take the first steps.

A letter of invitation from Mt. Zion's psychiatry department went to a number of the area's major institutions, suggesting they meet to explore how they might coordinate services and collectively assume responsibility for the mental health of all Westside residents. The first meeting was held in November and, over succeeding months, many more were convened. In addition to the institutions' representatives, others who attended these meetings at various times included representatives of the city and State Governments and the National Institute of Mental Health. The substance of the discussions ranged over dozens of issues, large and small, but the implicit goal of each was the same: to discover and define common purposes and to establish mutual trust. Dr. William Goldman, assistant chief of psychiatry at Mt. Zion and the man who later became the center's first director, was intimately involved in these discussions. He has described what was accomplished as follows:

"In reviewing the first year of development of the Westside Center; (7) the growth of cooperative planning and sharing simultaneously at various levels. It must be borne in mind that they varied considerably both with the individuals and the agencies involved. Regarding participation in the Westside Center, these processes included, in rough chronological order: (1) education; (2) reassurance as to aims and objectives; (3) wide involvement of key people holding responsible positions in the mental health agencies and programs; (4) the forming of the individuals involved into a group with the setting of preliminary goals and working through of long-standing doubts; (5) the gradual transformation of suspicion into trust, of unfamiliarity and ignorance into awareness and acceptance; (6) the clarification of potential gratifications in continued or further involvement and participation in the center; (7) the growth of cooperative planning and sharing of program aspirations; (8) a shift from agency to center considerations, and finally, (9) the beginning of identification with the concepts and objectives of the center."

Within a year, nine private, independent, occasionally competitive institutions had settled their differences. They agreed to give up some of their historical prerogatives and band together in a consortium, or partnership, and to apply for a community mental health center staffing grant. They were four hospitals—Children's, Mt. Zion, Pacific Presbyterian, and St. Mary's—and these agencies: Jewish Family Service, Family Service of San Francisco, Conard House (a halfway house), Suicide Prevention of San Francisco, Inc., and the California Medical Clinic for Psychotherapy. Critical breakthroughs in reaching agreement came when three of the hospitals agreed to commit half of their private inpatient units to the future center's program; when all partners agreed that an admission into any one of the center's service elements would be accepted as an admission into all; and when they agreed that Westside residents would be accorded first priority for care in their agencies.

The consortium received approval of its request for staffing funds from the NIMH Centers Branch in April 1968. With this assurance that the Westside CMHC would come to reality, and with similar assurance that State funding would be available, the consortium contacted all the community groups it could learn about, a total that eventually reached 85. It encouraged these groups to organize an area-wide Community Forum at which a Community Advisory Board (CAB) would be elected. The consortium requested community-wide support for acquiring matching funds from the city, and invited community involvement in the operations of the center-to-be. Dr. Goldman recalled that the community "was dubious at best, but willing to help and go along for a while to see if we would live up to our promises."

The first Westside Community Forum met in the fall of 1968 and was generally considered to have been successfully democratic. The 120 people who attended were able to settle their differences with far greater speed than the institutions had managed (which is understandable since they had nothing to lose and a lot to gain). They unanimously elected an interim CAB, which was charged with the responsibility of creating by-laws for a permanent CAB and convening a second Community Forum to elect its members within nine months. The interim CAB was also asked to elect from among its members individuals who would serve on the center's Board of Directors; half of the Board's votes were to be cast by community representatives and the other half by representatives of the consortium agencies. This latter charge was carried out before the end of the year.

Thus, after slightly more than two years of hard work by representatives of the area's mental health agencies and its community-at-large, and by local, State, and Federal officials, the Westside catchment area was transformed into a fledgling mental health community with the Westside CMHC, Inc., as symbol and substance. As suggested by the Federal guidelines, the planners had focused all their efforts on integrating and coordinating existing services and filling in service gaps. They had agreed that no new construction was needed.

When the center officially opened its doors in January 1969, it offered inpatient, outpatient, partial hospitalization, emergency and home-visits, and education and consultation services to all Westside residents. They had never before had a 24-hour emergency and home-visit service in their area, nor a day treatment center and an organized program of consultation and education. Moreover, residents who couldn't before afford the fees for inpatient psychiatric care in the area's private hospitals ("public patients") would now be preferentially admitted to these hospitals whenever necessary.

The census figures compiled so far certainly indicate that the program has closed some gaps in service. About 400 people (800 visits) are currently being seen every month in the Crisis Clinic (the emergency service), located in Mt. Zion. About one-fourth of these are treated there and no referral is made. The remainder are referred to other Westside services whenever possible, and occasionally to facilities elsewhere. From the beginning, care of drug-abusers has been the most pressing clinical problem. When word got around that the Crisis Clinic would do everything possible to get addicts into the State's methadone treatment program at Mendocino, applications quickly climbed to an average 70 per month. Unfortunately, the State's budget could not accommodate this

great a number from a single district, however urgent the need. Consequently, Westside cut referrals drastically and increased efforts to treat drug-abuse patients in its own programs. This change was necessary despite the fact that the combined referrals and treatment it had been providing was severely inadequate to the existing need. A comprehensive drug treatment program is currently the number one service priority (see below).

The center has also been successful in reaching poor and minority-group residents, one of the consortium's original objectives. Black residents were about one quarter of those seen in the day treatment program and constituted an even greater percent of patients treated in the emergency, home-visit, and crisis-intervention services. Inpatient admissions for black residents doubled from 1968 (the last pre-center year) to 1969/70—from 15 percent to 32 percent of patients admitted to consortium hospitals—and the average length of their stay increased from 10 to 15 days. It should be noted, however, that the average length of stay for white patients declined during this period from 29 to 15 days, data which reflect the efforts of all consortium members to utilize alternatives to hospitalization. This, too, is an important center priority and a grant proposal detailing plans for development of alternatives to inpatient care was recently submitted to the Department of Health, Education, and Welfare.

Westside is now nearly 3 years old. Eight new agencies have joined the original nine as service purveyors: Catholic Social Service, St. Elizabeth's Infant Hospital, the San Francisco Drug Treatment Program, four halfway houses—Baker Place, Progress House, Reality House West, and Walden House—and a specialized service, Pacific Psychotherapy Association, one of the very few psychotherapy services that focuses on poor black patients. In addition, the three-family service agencies together incorporated the Westside Social Service Agency in order to develop care for neglected children and plan aftercare programs. Like the drug treatment plans and the alternatives to hospitalization proposal mentioned earlier, these new service elements are being created in response to the community's needs as expressed by its representatives on the Board of Directors.

As the foregoing account of its origin and clinical program suggests, the Westside Center has accomplished a great deal: Organized as a multi-linked cooperative, including community participation at the highest policy-making level, it has begun to meet the challenge of providing total mental health care to all Westside residents. In recognition of these accomplishments, the American Psychiatric Association chose Westside to receive its 1970 Bronze Achievement Award. There can be no resting on laurels, of course,

for these very accomplishments have charted the center's immediate future and it is full of problems. Thus, the combination of a 24-hour walk-in clinic plus a strong community voice has succeeded in identifying several new clinical needs and in raising a complex of clinical issues. Given its auspicious history, Westside can be expected to work wholeheartedly at solving these problems and to continue its successful ways.

Two men have served as Medical Director of the Center—Dr. Goldman and Dr. William M. Bolman, a specialist in child psychiatry who came from the University of Wisconsin. In their judgment the success to date and the value of future operations depend on close attention to inner workings, i.e., the system mechanisms that make the clinical program a day-to-day reality. "Without minimizing the importance of the service components or the many challenging and fascinating clinical problems that have emerged," they wrote, "it cannot be stated too strongly that the clinical advantages of a consortium are entirely dependent on policy, administration, and funding. . . . In the case of the Westside Center, it has been very clear that the consortium partnership would have deteriorated rapidly without constant attention to these variables."

In the following section, which is based on an article by Drs. Bolman and Goldman, these aspects of the Westside story are briefly described.

Inner Workings

Administration is centered in a store-front office, about as large in size as a small supermarket, located in the middle of the catchment area. As is the case in any large enterprise, all of the administrative tasks are system-functional, some directly concerned with maintenance, the others focused more on growth and development. Thus, the work of the Central Office (CO) can be classified under the headings of executive, accounting, secretarial-clerical, communications and liaison, research and evaluation, and program development. Unlike the employees of a business enterprise, however, the 22 members of the CO staff are highly accessible and visible to their clients, which means all Westside residents. Excepting four small offices with doors, the CO floor space is wide open and staff workers are readily available to anyone who calls at the office.

This openness is deliberate, of course. It is a good example of the directors' efforts to fulfill their objective of fostering community contact and involvement in center operations. Another example worth noting is the staff position of community organizer. In creating this position, the directors were acting on their commitment to *inform* the community so that involvement would be

meaningfully specific. "As we see it," Drs. Bolman and Goldman wrote in their request for funds to establish the position, "the role of community organizer is specifically directed at helping achieve community competence in obtaining needed mental health delivery systems. He differs from both the mental health educator and the program developer in that these are basically content-oriented. He must be process-oriented and must remain a process-specialist whether the area be drugs, children, aftercare, or whatever. We suspect that the quality of mental health community organization will be a major determinant of the success and relevance of the individual community mental health centers." And, indeed, there already has occurred one dramatic instance in which the effectiveness of the community organizer's work was instrumental in saving Westside from the most drastic kind of social mental disorder—an angry confrontation between community groups.

Westside is funded from multiple sources, including patient fees and private insurance, Medicare and Medi-Cal payments from the State, the city and county of San Francisco, and the NIMH (via its staffing grant). A small but extremely effective fraction of its funds derives from philanthropic sources. In absolute terms, most of the total amount comes from public sources, that is, from local, State, and Federal Governments.

The Central Office is the fiscal intermediary between governmental sources of funds and the member agencies that subcontract with Westside, Inc., to provide the services. All Westside contracts stipulate that patient services will be reimbursed at cost (while recognizing that the same service can vary in cost from agency to agency), and that reimbursement will be sought from all other sources—e.g., the patient himself and/or any eligible third-party payors—before Westside is billed. Thus, assured by its contracts that the cost of mental health programs is shared among all the community's resources, Westside attempts to make the most efficient use of public dollars.

The task of monitoring the fiscal system in order to achieve maximum accountability for all dollars, public and private, has called for a great deal of effort from the very beginning. The CO staff has a huge and complex job just keeping track of so many different kinds of money; it has an even harder job when it comes to monitoring the system as a whole, for this requires full cooperation from every member agency's accounting staff. Drs. Bolman and Goldman described the early problems and how they were handled: "The fiscal offices of the agencies did not gear up or get sufficient administrative direction to meet the billing and book-keeping demands that the new and rapidly expanding services placed on them. . . . It became clear that the clerical and account-

ing personnel did not identify with these new programs, which they did not see as integrated parts of their agency. It was only when withholding funds was threatened that sufficient attention began to be paid to shared fiscal problems. Constant policing of this system was necessary until the remaining problems were worked out. The final step that we have not yet completed is that of a formal periodic review of the system to ensure that methods do not take precedence over goals."

There is one last word about Westside's structure of funding that deserves mention. Although the money that comes from philanthropic sources is, as noted earlier, the smallest in absolute terms, it has played a critically important part in the center's brief history. Modest grants from locally-based foundations have seeded new services and provided support for experimental programs. For example, one such grant made it possible for the center to extend a new service to hundreds of the community's young residents; this was the program established at San Francisco City College, where many of Westside's young people are students. In other instances foundation money enabled pilot drug abuse treatment and prevention projects to be started.

The structure and composition of the Board of Directors determine how policy is made and who makes it. Long before services began, it was decided that the Board would be the vehicle of fifty-fifty, agency-community control (Westside was the first center in the country to do this). In a sense, this was the first policy decision of the original consortium partners, and it stemmed from their shared conviction that health care is not a privilege but a right. In addition, the planners believed that community control of health service programs was a necessity if the gaps between existing services and mental health needs were to be bridged. Addressing their colleagues on this point, Drs. Bolman and Goldman have said: "Unless the gap between needs and services diminishes, the continuing white suburban migration and shift in national priorities can only lead to ever more intense charges by urban Americans, minority or otherwise, of irrelevancy at best and racism at worst."

The Board is, therefore, composed of two representatives of every agency and as many members of the CAB as there are agencies. Each agency casts only one vote, however, while every community representative casts a vote. It is worth noting again that the community representatives are elected directly to their positions by their constituents, the community residents; the agencies have no voice in their selection. This arrangement has proved workable during the center's lifetime, thanks to persistent efforts by all concerned to solve the problems it entails.

The problems were not unexpected for they were the inevitable outcome of bringing such disparate people together for the purpose of joint action, especially since much was at stake and all parties were passionately committed to getting a fair share. The problems occurred because Board members had very different, often opposing, points of view according to their different life styles and life values. In order for the agencies to see things from the community point of view, they had to understand what life in the community was like. As Drs. Bolman and Goldman noted: "This has meant knowing about the black experience particularly, but also includes knowing about the hippie and the Japanese subgroups." And in order for the community to get insight into agency concerns, it had to find people it trusted to spell out what these concerns were. Specifically, the community wanted (and has gotten) many of the key center positions filled by professionals who are minority group members. Further, among the first community priorities was a program to train community youth for jobs in the health care services area. (It was successful in this, too, for the center recently submitted a proposal for a grant to train psychiatric technicians.)

The process of learning to see things from a different point of view was difficult and time-consuming, but essential. According to Drs. Bolman and Goldman: "Mental health professionals themselves differ over whether preventive programs are possible, whether hospitalization has a significant role, and what the goals of rehabilitation should be. The differences are even greater when one gets into the potential roles of the mental health center in job training, in social action and in taking stands on political issues. It takes a great deal of staff time and support to enable the diverse Board groups to maintain their commitment and to work together to create a stable policymaking structure. There are unavoidable genuine stresses and conflicts inherent in such a structure. The critical point is that such conflicts are necessary if true cooperative relationships are to evolve. The agency representatives must be able to confront community representatives genuinely and not avoid the natural disagreements that will and must arise. The viability of the new alliance depends on working through real differences, not in avoiding them."

The Board's commitment to working through the differences prompted it to arrange a day-long retreat last October at which Board members and CAB members attempted to narrow their communication gaps. Just before the date, Dr. Bolman pointed out in the center's newsletter that a frequent source of disagreement was the nationwide shortage of money for center programs. "I strongly suggest that we turn some of our efforts towards the

outside world and talk about how to develop additional funding," he advised. "This is a task that will need the help of both Boards and all committees. It should not be delegated to staff, as it is too large and too important."

Although shared responsibility and shared control have generated a lot of difficult problems, the most important thing to be said is that they *are* being realized. One has only to look at how the service program has changed since the center opened to conclude that Board members are indeed learning to work toward common goals. In virtually every instance, the new service elements which are operating or are in the planning stages were developed to fulfill a stated community priority—e.g., greatly expanded care for drug-abuse patients, child-care services, alternatives to hospitalization and aftercare programs, expanded services in the local City College, job-training programs for community youth.

In sum, the system's inner workings have served the center well even if they have not always functioned smoothly. The clearest demonstration of this was the way the center was able to respond when the community was struck by a drug-abuse epidemic.

Center Response to the Community Drug-Abuse Epidemic

During the months following the center's opening in January 1969, it gradually became evident that a drug-abuse epidemic was spreading through Westside. The community requested prompt action, but the agencies were not at all sure about what they could or should do. They pointed out that addicts were difficult and unrewarding to treat, and that drug-abuse behavior has traditionally been viewed as a social problem calling for social controls. Community spokesmen were adamant, however; their arguments grew increasingly more insistent and eventually they did succeed in convincing the agencies that the drug problem threatened the integrity of the community as a whole. With unity of purpose thus achieved, the Board of Directors quickly began to act.

A Westside Drug Conference was convened in the fall of 1969. This led to the formation of the Drug Planning Council which was charged with the task of developing an NIMH staffing grant proposal for comprehensive drug treatment. Meanwhile, additional funds were solicited and obtained, in modest amounts, to strengthen and keep alive the newly emerging drug programs.

Backed by both the center and the community, the Drug Planning Council was able to produce an extremely thorough and realistic plan, one that might well serve as a model for other urban communities. The plan called for a broad range of direct treatment services—including, for example, a 24-hour crisis clinic exclusively for addicts, halfway houses, and methadone maintenance

units. It also included a re-entry program (e.g., job training and placement, family counseling, legal assistance); a program of community involvement; extensive preventive services; and plans for research and evaluation of the whole. In short, the plan envisioned the use of every approach known to be effective, and it integrated these approaches in a total program that assured continuity of care.

This masterful plan, embodied in a \$500,000 grant proposal, was submitted to NIMH in mid-1970. Subsequently, it was approved—but not funded; the center was advised that no funds were available. Pursuing its commitment to the community, the center came back to NIMH with a scaled-down request for support, noting that “it would be criminal neglect on our part *not* to request new funds because of the overwhelming need. . . .”

While continuing to look for other sources of support, Westside has made crystal clear its conviction that only the Federal Government has the resources to meet the need. Compared to the enormity of the problem, Drs. Bolman and Goldman have noted, “the amount we are able to spend on drug treatment, \$5,000 a month, is ludicrous, a form of social insanity.” Indeed, the statistics are staggering: As of mid-1971, an estimated 2,000 people in the community are hooked on heroin at a cost of \$100 a day, or a total of \$72 million a year. Moreover, every high school in the area has a drug-abuse problem and elementary schools report that 9- and 10-year-old children are experimenting with drugs. In concluding their justification for at least a fraction of their total need, the directors wrote: “We respectfully plead that the stated unavailability of funds be re-examined in the light of the staggering human and economic need symbolized by the \$72 million in heroin costs alone. We do not pretend that we can reverse or even stem the epidemic with these new positions, as that would require a much larger request. We are simply attempting to prevent the chaotic disintegration of our existing clinical capacity.” This grant was finally funded by NIMH in July 1971.

Looking Ahead

It seems certain that Westside will continue to grow and change in the months ahead. At this point in time it is possible to foresee two factors that will strongly influence the shape of future changes, in addition, of course, to the potent factor of direct community input.

One of these is the evaluation program, which currently includes several projects. In particular, the center has recently launched a computerized method of monitoring the intra-system movement of patients. This is the Transactional Reporting System, which records data (admittance, transfer, discharge . . .

time, date, agency, service) involved in patients' use of the clinical system. Eventually these data will provide the rationale for changing the way one or another service is delivered. In essence, the Transactional Reporting System was programmed to analyze the operational reality of the transfer and referral system in order to measure how well the center is doing at providing truly coordinated care.

A second evaluation project entails collecting basic data on patient characteristics in order to discover whether the agencies are serving more area residents currently than they did in recent pre-center years.

A third project concerns goals—the way members of the Board of Directors perceive center goals, the way caretakers involved in individual service elements perceive their service goals, and the way their clients, the patients, do. The purpose of the study is to determine how the center's broadly stated goals are translated into operational terms by different people. In part, it is an attempt to get at cross-cultural differences concerning what constitutes mental health or disorder. Thus, it will shed light on the specific ways in which urban subcultural groups differ when it comes to defining the terms, mental health or disorder. Center directors hope that the study results will open the way to more effective communication within the system.

Of all the factors destined to shape the center's future, however, none will be more influential than the financial support required if the center is to fulfill its declared priorities of mental health care services to children, development of alternatives to hospitalization, drug treatment and prevention services. Without such support, the center will, of course, continue to provide high-quality care within a traditional mental health service and delivery program. If, on the other hand, sufficient funding is granted, the center will be able to develop a truly comprehensive range of new services and delivery methods to meet the needs of all West-siders.

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Nonprofessionals Serve Aged Public Housing Tenants: The Senior Advisory Service

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Old people living in public housing, in New York City, are often caught in a web of difficult circumstances. Loneliness, anxiety about failing health, and fear of being attacked are so common as to go unmentioned. By definition, poor and old, they have often been left behind by relatives who have moved away from the problems of the city. Five women with brief training were able to help almost 1,000 elderly tenants of four large housing projects in the South Bronx. These women, beginning second careers in their middle years, provided on-the-spot help: a small office was set up in each housing project, and an active program begun. Under the sponsorship of the Community Service Society of New York, a voluntary agency founded in 1848, and with an experienced supervisor, these women were able to help the elderly cope with a wide range of problems.

A survey was conducted and it was found that the major problem for elderly tenants was the complexity of the city's resources and an inability to use these resources independently. *It was found that 79 percent of the tenants, although undeniably poor, were not on public assistance.* Health and financial problems were widespread and, in general, the aged tenant needed help in locating clinics and in utilizing the complex array of health and welfare services. Once appropriate agencies were located the older person still faced tremendous obstacles in obtaining help. Public transportation was frightening to even life-long residents of the city. Subways have no ramps for wheelchairs and no elevators for easy access, while crowds and subway cars move at rough and hazardous speeds. Buses also pose problems. When the aged person is

able to reach a clinic or agency, lines and procedural difficulties often succeed in discouraging him. The Senior Advisory Service workers were able to help with some of these issues and to intercede with agencies and clinics in a very successful way.

The Senior Advisory Service, as this project was called, was able to help with some of the most basic and pervasive problems, such as depleted funds, loneliness, and concerns about deteriorating health. Often the older tenants—a tiny minority of about 7 percent of the entire tenant population in the four housing projects—lived isolated lives, fearing that involvement would lead to rebuff or exploitation. Often they felt alien among the larger group of tenants. The Senior Advisory Service workers were visible, available, and provided a link between tenants, many of whom were potentially helpful to one another and to the outside community. The importance of this link cannot be underestimated, as it helps the elderly tenant to remain independent, to obtain support and assistance with temporary problems. An older person with a prolonged illness who must enter a caretaking facility may in this way lose his apartment—his home—never again to regain his independence. *The New York State Department of Mental Hygiene estimates that of the 8,000 elderly persons admitted annually to State mental hospitals about half are admitted only because they cannot maintain themselves without some help in the community—home services are scarce.* The total aged population of New York City alone is now estimated to be one million. As of January 1, 1969, some 38,000 elderly families or individuals lived in public housing. As the waiting lists are two to three years long, there are potentially many, many others who could greatly benefit by the type of services offered by the Senior Advisory Service.

The Use of the Nonprofessional Worker

The Senior Advisory Service was designed to utilize nonprofessional workers of a specific type and to supervise and train them. About 35 applicants were interviewed and 5 women between the ages of 48 and 60 were selected. Although men were interviewed, none seemed to suit the demands of the job as well as the women who were selected. These women were all bilingual, speaking either German or Jewish or Spanish in addition to English. They were all competent, mature women. Two had college degrees and all had taken some college classes. Several had been secretaries. None had done any sort of social work before. One worker was black and one Puerto Rican, the others white. All were active and in good health. All of the workers were or had been married; two were widowed. Four of the five had children. All were excited by the prospect of a new career, were involved in the project and

identified with the sponsoring agency, Community Service Society.

A three-month training program was planned. The workers met with various specialists from the community at large and from the Community Service Society. The training program included discussion groups, assigned reading, visits to community agencies, and a brief supervised field work period. It was later concluded that more of the training could have taken place after the worker was on the job. The trainees tended at first to use their personal experiences rather than relevant conceptual material when faced with a problem; they felt bewildered and overwhelmed initially when they found themselves all alone in the housing project facing the tenants for the first time.

Although supervision and worker meetings continued throughout the two service years, it was felt that even more of the training could have been done concurrently with practice—a combination of field work practice and actual service.

Mrs. Jeannette Friedman, a professional social worker who is now on the faculty at the New York University Graduate School of Social Work, was the program supervisor. She met regularly with the workers and helped them draw upon the resources of the Community Service Society for help. The workers felt that their affiliation with this agency gave them recognition as full colleagues by the workers in other agencies. Mrs. Friedman observed that the workers were in a difficult, isolated position, and that they needed a great deal of support. They also needed the recognition of others that they were facing many irritating situations and some insoluble problems. Also they were unfamiliar with the social work concept of supervision. In the beginning they were cautious and fearful of it, competitive with one another and defensive. After all, in terms of their previous work, all had been independent and at times supervisors themselves; they tended to view supervision as criticism rather than as a training or learning process. Recording of content and extent of contacts were also difficult for most, although simplified procedures were devised. As they saw more clearly the connection between recording and research, their skill improved.

The workers were encouraged to pool their strengths and skills. For example, Spanish-speaking workers helped their colleagues with Puerto Rican tenants. Misconceptions and stereotyped views were expressed at times about such issues as ethnicity, religion, poverty, and prejudice. Feelings about welfare, dependency, etc., were also important. Attempts were made to help the workers become aware of their own attitudes and to foster change where necessary. For example, one discussion addressed the question of why elderly people often fail to make use of their access to surplus

food programs. One worker emphasized that the food packages were heavy, and that the elderly had a hard time standing in line. Another worker said that she would be ashamed if she had to stand in line and let people see how poor she was. After a heated exchange another worker replied that she "had always managed to work and support herself." It became obvious that feelings of shame and degradation were associated with poverty and that the workers—reflecting the societal attitudes—at times felt punitively. The inappropriateness of these feelings became apparent as the workers examined their attitudes in the light of specific individuals.

The workers also experienced tensions about race relations. As a mixed group working with a mixed population, the issue of prejudice was a complicated one. One white worker revealed that she had been afraid to work with blacks, but as she felt accepted and successful she became less concerned. The black worker felt that the prejudice was too pervasive to discuss. Still, most confided privately some concern about one or another of the ethnic groups represented in the housing project. This was an important area for the workers to face as it was a prevalent problem within the housing project and one that had serious import for the elderly tenants.

The Site

The South Bronx has a population of about 400,000 persons. It is one of the poorest areas in New York City. While it has some well-to-do residents and some well-kept areas, for the most part it compares to problem-riddled sections of Harlem or central Brooklyn. About 30 percent of the residents are white; nearly 30 percent are nonwhite; and 40 percent Puerto Rican. The buildings are deteriorated, overcrowded, and the area has high rates of crime, juvenile delinquency, alcoholism, morbidity, infant mortality, and drug addiction. The white population is gradually leaving. By and large, the aged persons in the housing projects are white. In many cases they have been left behind by their families who have moved to the suburbs. There is at present no synagogue to serve the remaining elderly Jewish population. A once thriving Yiddish theatre has disappeared as have Jewish schools and cultural clubs. Many abandoned synagogues have been converted to churches that serve the black or Puerto Rican population. Many of the white residents still remaining have lived in the South Bronx for many years and tend to view the newcomers as responsible for the decline of the neighborhood. In fact, the South Bronx has had many waves of immigrants, and it has been over 20 years in its deterioration.

Four housing projects, Adams, McKinley, Mill Brook, and Moore Houses, were chosen for the service phase of the research program. Two, Jackson and Patterson, were chosen as control units. All of these projects rise from 15 to 20 stories and are less than 10 years old. The grounds are well kept, playgrounds are in repair, and benches line the walks. One large project has a center area, like a village green which has a lively air, and when the weather permits many tenants gather there to relax or watch small children at play. The interiors of the buildings are impersonal, but clean and well-maintained. There is, however, a deadly monotony to the exterior appearance of the buildings, and only inside the individual apartments is there any distinction or personal flavor. Three of the four buildings in the service project have community centers; however, these are largely geared to and used by the young people. The area around the housing units is marked by old and falling tenements. There are many vacant lots which are filled with debris. Signs around the housing units read "Starve a rat today" giving vivid testimony to another problem. There are numerous large warehouses as well as many commercial and industrial areas. The one large open space, a city park, goes largely unused due to the fear of being attacked. Railroad yards occupy the waterfront along with a barge terminal for fuel and building materials. The area is served by Lincoln Hospital, Prospect Hospital, and a Health Insurance Plan Group.

The Model Cities Program, authorized by the Demonstration Cities and Metropolitan Development Act of 1966, is expected to raise substantially the level of housing, education, health, medical treatment, and social services, but no noticeable impact has as yet been seen. A multi-purpose community center and a health clinic is now in operation.

Research—Pre-Service Interviews

All persons 60 years or older as of April 15, 1966, who resided in the six housing projects, comprised the population under study. A total of 953 persons, 60 or older, lived in the four experimental units and 605 lived in the control projects.

Characteristics of the experimental and control groups were essentially the same. The age groupings were evenly matched. Both groups had about 60 percent women and about 70 percent in each group lived alone.

For research purposes 400 tenants from the experimental population and 200 tenants from the control population were selected for interviewing, both before the service project began and after it ended. This allowed for an assessment of the results of the service program. Interviews were conducted by women with three

weeks of training in interviewing procedures. The interview schedule was in both English and Spanish, covering such areas as personal history, social activities and family relationships, economic and occupational status, health, and observations by the interviewers. Two interviewers spoke fluent Spanish.

Every effort was made to reach the selected tenants and to allay their fears about being interviewed. Letters and cards were used to introduce the program and the interviewer. It was difficult to reach tenants at home and interviewing hours were extended to evenings and weekends. The proportion of completed pre-service interviews was very high. Most incomplete interviews were due to a refusal of cooperation or the unavailability of the tenants despite repeated calls.

Post-Service Program

From May 23, 1966 through May 17, 1968, the Senior Advisory Service was in operation. An office was set up in each housing project. Since no provision had been made in the buildings for office space for such social services, small spaces had to be used. In two cases the "pram" room, originally designed to store carriages or bikes, was converted to an office. (The crime problem had made people reluctant to store belongings in these areas.) A major shortcoming of this arrangement was that the only available toilet facilities were located in the adjacent community center or in the manager's office. In two units, apartments were used for office space. However, this meant that one less apartment in each unit was available to house tenants. One worker was stationed in each unit and a fifth, the floater, provided coverage in the case of illness, vacations, or occasional special projects. Two clerk typists served the four workers. The supervisor and a full-time administrative secretary operated from an office near all four housing units. Service was available to tenants from 9 a.m. to 5 p.m., five days a week.

Careful records were kept. The workers' concern was specifically the elderly person; to the extent that other family members affected the elderly, the workers dealt with the entire family. Files were kept "open" so that service could be continued for the full two years, if needed.

Introduction of Service

All aged tenants were notified of the new service program. Letters were sent with the signature of the individual worker. Posters were placed on bulletin boards. Open-houses were held and the managers of the housing projects publicized the new program

in their newsletters. Feature articles were carried in the Bronx newspapers. In fact, throughout the project the local newspaper was used to spread information. When the original project ended in May 1968, there were several articles expressing concern about its loss. Further articles publicized the subsequent reinstatement through community support after the end of the NIMH grant.

The service workers tried to get to know all of the leaders in the older people's community as well as the housing staff and personnel in all the appropriate health and welfare agencies. It was felt that sponsorship by the Community Service Society was helpful to the workers and made the program more easily acceptable not only to the tenants but to other service agencies. Contact was made also with various groups such as the Tenant Association and the Golden Age Clubs. The workers joined with such groups to press for improvements in security protection services, additional recreational facilities, and to help resolve conflicts between young and old tenants within the project.

Volume of Activity

Through active reaching out and concentrated attention, about 87 percent of the 953 elderly persons living in the experimental housing units were contacted during the two-year period of service. Some did not wish service, others did, but this was considered a highly successful effort. An additional 120 who moved in after the service began were also seen. Thus, a total of 950 persons living in 754 families were served in the two-year period. After an initial visit by the worker or a "drop in" visit by the client, follow-up contacts were made—these totaled 16,969. The workers made an average of 23.5 contacts per tenant.

The great majority, about 62 percent, of the tenants were seen for the first time when the worker made an appointment and visited their apartment. About 15 percent were first contacted by telephone. About 20 percent of the tenants came to the office to get acquainted. Records show that it was very important for the worker to reach out and make the first overture in most cases. Despite the accessibility of the office and the spread of information, the tenants did not easily seek out the service staff.

Of those served, 53 percent were 70 years and older, and 60 percent were retired or unemployed and most were very poor. Insufficiency of funds was one of the most frequently expressed problems. A large part of the service workers' efforts was directed towards helping tenants obtain financial assistance. In many cases the client did not wish to be dependent or did not understand the public assistance system and other financial aid programs. Many felt that it was unsafe to leave their apartments and that they

were too feeble to wait in lines in welfare offices. It was interesting to learn when the results were studied that the control group, which had a welfare worker stationed in one of the housing projects, had a larger proportion receiving public assistance at the end of the two-year service project than the experimental group. The placement of a welfare worker on the site facilitated the establishment of eligibility and allowed the aged tenants to be served directly. Even with the Senior Advisory Service assisting and interceding, the aged applicants still had to observe normal and time-consuming procedures.

About half of the clients were living alone. These tended to have the highest proportion of problems.

Ethnic and religious composition of the tenant group was important. Approximately one-fifth of the tenants served were of Puerto Rican origin, and the elderly Puerto Rican tenants were at least part of the racial majority in the units—this was not true of the elderly Jewish and other white tenants. The elderly white tenants were most often long-term residents of the area and tended to blame the newcomers, the Puerto Ricans and the blacks, for its decline. Differing life styles were the object of criticism. The elderly tended to feel that the younger tenants, regardless of group, were not raising their children right, specifically not raising them to respect the elderly. Although two of the service workers were black or Puerto Rican servicing white tenants, this did not present any difficulties. The workers tried to relieve the tensions and encourage better relationships through social activities, clubs, and group meetings.

Problems

Most of the tenants had difficulties managing various aspects of their lives. The complexities of agency procedures, health and financial problems were most commonly the issues brought to the service workers. New programs such as Medicare and Medicaid were confusing. Immobility, due to infirmities, such as blindness or crippling, or else due to urban transportation, was a common problem. Recently a reduced rate for the aged has been made available on New York subways and buses during slow hours, but there is still concern that this will not wholly solve the problem. The elderly person is concerned about attacks and assault, and the physical demands of travel overwhelm him. As has been mentioned, none of the subways have wheelchair ramps or elevators, making it necessary to negotiate steep stairways often in the midst of fast moving crowds. The service workers found that these issues were often the decisive ones in causing their elderly tenants to miss appointments, to fail to appear at clinics and agen-

cies. The hospital clinics were also very difficult for the aged. All too often a different doctor was seen at each appointment and many clients found this, and the need to constantly repeat their medical history, very disturbing. This was particularly a strain as many were quite concerned about health, and it put them in a position of great responsibility for coordinating their own care. The long waits were also very trying for the weaker elderly tenants. Some of the Spanish-speaking tenants had a hard time making themselves understood. Although all of the clinics supposedly have Spanish-speaking staff, often the elderly tenants never had such contacts. In one case a Puerto Rican woman received a diet list in English. When the service worker called the clinic, she was told that diet lists were available in Spanish, but she was unable to obtain one and so helped translate the list. Apparently in this case the service worker was able to bring enough attention to the problem so that the clinic made diet lists readily available in both English and Spanish. The elderly often had a hard time when ill in obtaining a home visit by a doctor, although many of the clinics are reported to provide this service. Often aggressive intervention by the service worker was necessary to obtain home visits for an ill person living alone.

The major health problems of this group included: diabetes, arthritis, heart and circulatory diseases, asthma, failing sight and blindness. In addition there were numerous temporary acute illnesses which caused serious hardship for the individual who lived alone. Many of the health problems required continuous attention by the service worker and often demanded services not readily available, such as home nursing, homemaker, or housekeeping services. The service program that eventually developed out of the original demonstration project has stressed the use of other elderly tenants as housekeepers, as well as escorts. It has also been made possible to have someone shop for a homebound person, another serious problem and one that often forces an elderly person to move to a nursing home and to give up his independence long before he is really willing to do so.

In general, the older the tenant the more problems he expressed to the worker. Women were more likely to ask for help than men and those living alone were more in need than those living with others. About 52 percent of the group has multiple problems. In many cases the worker was aware that loneliness constituted the real problem, but that tenants presented minor issues in order to establish a relationship. Some elderly tenants began to sit in the vicinity of the project office feeling reassured by the presence of the workers and finding this a way to relieve their isolation.

Less frequently mentioned directly, but pervasive nevertheless,

were fears about personal safety and loneliness. The workers did not attempt to deal directly with emotional or mental illnesses, or long-standing marital strife, but did help tenants to find the appropriate professional resource. The workers found, too, that publicity given the service helped to focus the type of problems the tenants expressed. About one-fourth of all services were informational. About one-fifth were supportive in nature and about 19 percent were referrals.

One area in which the workers were very successful was that of cooperation with the Housing Authority. For instance, when one elderly woman was temporarily unable to manage alone, a homemaker was located, thus averting the need to move and eventually relocate the client. In another case, the younger relatives of an aged tenant, all public housing dwellers, were moved to a nearby building so they could visit and provide day-to-day help for their elderly relative.

The service workers were also valuable in funneling the activities of the intact, concerned elderly tenant who wanted to do something for others. One tenant, energetic and lively at 63, organized a Golden Age Club where she lived. She had been a volunteer in community agencies for over 30 years. She was able to be a persuasive and able spokesman for the elderly tenants and to help others use the help that the Senior Advisory Service offered.

Financial Problems

One half of the elderly tenants felt that their incomes were not adequate to "cover the necessities of life." Approximately two-thirds said that their incomes were less at the present time than at age 50. About 30 percent, the younger ones, said their income was about the same or more than at age 50. *About 30 percent of the tenants had incomes of \$100 or less a month.* Forty percent had from \$101 to \$200 a month. When the incomes of all family members were considered, the result showed that a majority (of the elderly tenants) had \$200 or less a month and only 18 percent had \$301 or more in income.

In New York City, where there are approximately one million residents 65 years of age or older, fully one-half, or 500,000 persons, live on less than \$3,000 a year, while one-third of the elderly live on as little as \$2,000 annually.

Social Security or Railroad Retirement was a source of income for two-thirds of the respondents. Only 21 percent received public assistance. Only 16 percent received any wages or salary, and only 14 percent had private pensions. About a third received money from several sources.

Even though the incomes were low only a few tenants claimed

to worry a great deal about money. About a third felt that in an emergency they could turn to relatives; about 15 percent would seek aid from the Department of Social Services. *However, about 29 percent avowed that they had "no one" to help them in a financial crisis.*

Inflation has seriously hurt these people, especially those with small fixed pensions. The elderly tenant was rarely able to provide more than the bare minimum for himself. An occasional vacation or even a small outing was usually possible only through a gift from a friend or relative.

Many of the elderly had been so critical of those who needed public assistance—feeling that they had worked while others “were getting away with something”—that now when they needed assistance themselves, they were very ambivalent about seeking it.

Prior employment in most cases had been blue-collar work of a skilled or semi-skilled nature. Only 1 percent of the respondents was previously employed in a professional or technical capacity. Nearly half had left the labor market, so they said, because of their own illness or poor health. The second most frequently stated reason was retirement, either compulsory or voluntary.

Social Isolation

Sitting alone in a room watching television, reading, or listening to the radio and then having a solitary meal was the characteristic life-style for elderly persons living in these housing units. Isolation was a way of life. Loneliness was widespread. The broader picture of the housing projects contributed to this. The elderly tenants lived in large complexes with other tenants of all ages. Only 7 percent of the population was over 60. While a common theory is that this keeps the elderly person in touch with life and in a more normal environment, it also means that in many cases he is at a disadvantage. For instance, the few community centers available were largely devoted to activities for young people. There were no common dining rooms or even available communal kitchens where lonely widows could get together to cook meals and dine. The units were diverse ethnically, racially, and religiously which made some elderly people feel threatened and isolated. By and large the elderly seemed strange to the young tenants and vice versa. In some cases language was an impediment to social life and understanding.

Tenants in the housing projects reported few friends and about a third indicated that they had not visited with any neighbors or friends within or outside the project during the preceding year. In some cases the elderly tenant was afraid of being exploited by

the other desperately needy tenants and therefore discouraged relationships.

The research team points out that the popular conception of leisure time during the later years is a cruel hoax. For the poor it becomes merely unoccupied time and often proves very depressing. The older person may find he has no focus, no schedule.

Personal Safety

The elderly tenants were deeply and realistically concerned about being attacked and injured. As a weak and relatively defenseless group, this concern hampered even their most casual activity. Fearing that they would be injured or their apartment robbed, they tended to stay home, isolated, and desperate. The housing project managers, the housing police, and the local police were keenly aware of that problem and made some efforts to deal with it. However, money is needed to make improvements that would really help—more lighting, manned elevators, more house guards, and increased police protection. The Senior Advisory Service at least offered, for many, some company on outings or necessary trips and a few neighbors who would be concerned or help if anything suspicious occurred.

Perceptions of Health

The individual's perception of his own health does not always coincide with the evaluation of a physician. However, subjective opinion of health is often a good indication of morale and ability to function. The elderly also tend to judge their own health in terms of what is normal for their age. In this group, about 44 percent considered their own health fair, and 29 percent said that their health was good or very good. Twenty-seven percent found their own health to be "poor." A small group thought that their health had improved over the past two years and about half said their health was remaining about the same. Members of this study group were generally more negative about their health than national surveys show the aged to be, but perceptions of health and socioeconomic status tend to go hand-in-hand. Social isolation is also involved. By and large, if you are poor and can barely manage any medical expense and if, in addition, you live alone so that there is no one to look after you, then it is likely you will feel more threatened and conscious of ill health than if you had ample resources.

When asked directly, three out of four stated that they had health problems such as rheumatism, asthma, ulcers, or heart conditions. Only about one-half had seen a doctor or dentist in the

previous month. Most were mobile and able to get around. About 8 percent needed assistance to leave their apartment and another 4 percent said they would not leave their apartment except for emergencies. Few commented that they were concerned about their health.

Personal View of Self and the World

Less than half of the respondents who were surveyed saw themselves as old and most respondents found that peace of mind and being alive were good things in their later years. For 14 percent, however, their later years were of dubious value and there was "nothing good about this age."

The majority felt that they were happy with life and only 11 percent had been unhappy in the last month. The majority also saw themselves as "not the worrying type." Two-thirds saw religion playing an important role in their life. The religious affiliations were as follows: Roman Catholic, 43 percent; Protestant, 36 percent; and Jewish, 16 percent.

The respondents, despite their relatively positive statements about the condition of their lives, had a relatively negative view of the world. They were asked to indicate agreement or disagreement with five statements from the Srole Anomie Index and, in general, they indicated that they felt discouraged. The investigators suggested that pessimism may be based in part upon the respondent's feelings of frustration in attempts to deal with an environment generally geared to the young, healthy, and energetic. It seemed that the aged in this demonstration tended to see their problems as stemming not from old age alone, but from the assaults of an environment which is hostile and unsympathetic to their needs.

Results of the Service Program

An assessment of the service program can be made in two ways: first, by looking at the outcome of the bridging and other services rendered by the workers; and, second, by analyzing the effects of the program on the emotional, social, and physical functioning of the older tenants themselves.

Of the problems expressed, 78 percent were resolved in the sense that they were handled. Tenants received needed information, were accepted by appropriate or substitute resources, or received continuing standby service from the service workers. Some 13 percent of the problems were not resolved and 9 percent were pending.

To assess the effects of the program on the tenants, information

was at hand to compare the post-service responses with the pre-service interviews for the experimental and control groups.

On the whole, the experimental group was better off at the end of the two-year service period than the control group. The oldest persons seemed to benefit most from the service program. When individual questions were looked at, the results were as follows:

Health: The experimental group indicated an improvement in self-ratings of health and the control group indicated a deterioration.

View of Self and World: The experimental group reported an increase in happiness and feeling good about themselves that was significantly greater than that reported by the control group; the experimental group tended to be less negative in their view of the world.

Satisfaction with the Neighborhood and with Project Living: Both groups reflected increasing dissatisfaction, but the experimental group had their level of satisfaction sustained more adequately than did the controls.

Church and Club Attendance: Both groups attended less often; again, attendance in the experimental group did not drop as quickly.

Income: A greater proportion of the control group was receiving public assistance and income from other sources, despite the fact that the experimental group definitely had gains due to the service program. Significantly, a welfare worker was stationed at one of the two housing projects in the control group.

Worry over Money Matters: Down for both groups but the decrease was greater for the control group.

Talking with Relatives: Control population increased more than the served population in the frequency of their talks with relatives not living in the project.

The presence of the worker, the program, and the work done on behalf of the aged tenants appear to have sustained the tenants' positive attitudes. Because of the active on-the-spot work of the welfare worker, the control group made greater gains financially.

Community Support

This project has made the precarious transition from being a demonstration project to becoming an accepted part of the community network of services. Permanent funding remains problematic.

As the two-year period of NIMH support drew to an end, the enthusiastic support of the elderly tenants who had been served encouraged the project's sponsor, the Community Service Society, to seek continuing support for the service. Elderly tenants cam-

paigned actively for its continuation and enlisted younger tenants in the campaign. Supporters turned out in substantial numbers to seek the support of Bronx officials and a commitment by the City Housing Authority. They petitioned their Senators and Congressmen to support legislation that would authorize funds for tenant and management services in federally-aided public housing. Local businessmen and local agency representatives also cooperated.

"We don't want relief; we don't want Cadillacs; we just want an open door." This was the comment of one tenant working to save the service. A one-year grant contingent on matching funds was obtained from the George W. and Julia M. Loft foundation. At the same time it became known that the National Council on the Aging was negotiating a contract with the U.S. Department of Labor to administer a one-year "senior community service program," with funding by the Office of Economic Opportunity. In that program, 400 retired or unemployed persons, aged 55 and older, whose incomes were below stringent poverty levels would be employed part time at minimum hourly wages. This program was to begin in ten communities, one of which was the South Bronx.

The Community Service Society and the City Housing Authority jointly financed a holding operation to serve the four housing projects until a permanent plan could be developed. This meant that a curtailed version of the Senior Advisory Service was to be maintained over the summer of 1968.

The Bronx Foundation for Senior Citizens, a kind of consortium of agencies, then came into being. One of its functions was to operate a store front center for older adults. It also functioned as a partial funding agent for the Senior Advisory Service under the continuing sponsorship of the Community Service Society and with the cooperation of the Housing Authority.

In August 1969 a new project, the Senior Community Service Program, was begun. This new venture, an outgrowth of the original Senior Advisory Service, operated under the aegis of the Housing Authority which provided supervision and space. It was also part of the Bronx Foundation. This service employed nonprofessional bilingual workers from the elderly themselves who worked under professional supervision. In this project the aides were drawn from the group to be served and were not the "para-professional" type of "second career" women in the original demonstration. Both men and women worked in this project. They had little education and were over 65, all had poverty level incomes, and needed the money they earned. The aides developed a program uniquely suited to their own abilities. They provided escort service, shopping for invalid or blind tenants, and telephone reassurance services. For a small group of tenants who lived alone, a type

of homemaker service was developed. This was very helpful when temporary illness struck. In some cases the fellow tenant had easier access to the tenants than the previous group of service workers. There were some drawbacks as there was a need for increased supervision and more help in dealing with various social agencies. The morale of all involved, however, was very high. At the present time the Housing Authority hopes to expand the program to include other housing units if Federal funds are available.

Conclusions

The Senior Advisory Service was very successful, both at serving tenants and also in demonstrating effectively the value of such a program. Nonprofessionals, both the second career workers and the indigenous workers, were competent and valuable. This program had the added benefit of being a source of satisfaction for its staff and a great deal of benefit accrued to the nonprofessionals as well as to the tenants served. The ferment and activity provided stimulation for the elderly tenants to become engaged in community life. The need for such programs can hardly be disputed, and the value is possibly or probably far greater than the research figures show. Active reaching out is necessary and possible. There is a tremendous need for reform in the delivery of services by the community to the elderly tenant as well as a need for a higher level of available services.

The housing projects and the surrounding areas house many isolated elderly persons. The research team recommends that mental health centers and other agencies incorporate services like the Senior Advisory Service in their programs on a neighborhood basis. Mature persons of sensitivity and appropriate capacities should be involved and employed wherever possible. This service proved highly feasible and not very expensive—and it might well serve as a model for the establishment of similar programs. In this program the sponsorship and affiliation of an experienced, community-based agency were extremely important.

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Nursery Schools in the Service of Mental Health

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Introduction and Summary

An Institute-supported program in San Francisco has been quietly fighting racial prejudice—regarded as a major mental health problem—through the medium of little children. In an area of the city known as the Western Addition, where slum neighborhoods are being replaced by urban renewal projects, to the resentment of the predominantly poor and predominantly black population, this program has demonstrated that a special kind of nursery school can bring together all kinds of people.

Mary B. Lane, professor of education at San Francisco State College, who conceived the program, calls this kind of nursery school *cross-cultural* or multi-cultural. By this she means a school that enrolls children of different races and socioeconomic levels and uses special curricular and organizational devices to promote interfamily, interracial relations.

In 1966, Dr. Lane and her associates opened three nursery schools for 60 children, selected in door-to-door canvassing, who had recently passed or soon would pass their second birthday. The racial and socioeconomic background of the children reflected those of the community. About 60 percent of the youngsters were black, 30 percent white, and 10 percent Oriental, meaning Chinese, Japanese, or mixed. About one-third of them came from families living in low-cost public housing; one-third of the children came from new, cooperatively owned, apartment development for people of middle income; and the rest from families in individual dwellings. This last group—designated for research purposes as the “random housing” group—ranged from families of unskilled workers to those of professional men. In each racial group, the families represented several socioeconomic levels.

The schools were known as Nurseries in Cross-Cultural Education, or NICE. They were in rooms lent by the Buchanan Y.M.C.A., the Christ United Presbyterian Church, and—in a public housing unit named the Westside Courts—by the San Francisco Housing Authority.

Each school was staffed by a professionally trained nursery school leader, an assistant who had had experience with children, though not as a teacher, and a part-time aide who was from the community. The staffs were racially mixed—white and black. An effort to recruit Oriental teachers failed. One teacher or aide at each school was a man because Dr. Lane thought that the many children, about a fourth of the total, without a male figure in the home should have one at school.

The general aim was to assess the schools as instruments for promoting mental health in a community subjected to the stresses of redevelopment. Results were to be appraised in terms of factors related to mental health such as basic trust, autonomy, initiative, cognitive development, and social competence, in the case of the children and, in the case of the families, social competence, inter-group acceptance, and utilization of community resources.

The program stressed parent involvement. Mothers gradually took on the role of aides during the sessions—three hours every morning—and participated in a number of after-school activities, sometimes with fathers. During the second year, responding to mothers' requests for more information about techniques of teaching, Dr. Lane gave a 30-hour training course, modelling it on one of her courses at San Francisco State for prospective nursery school teachers. To meet the demand the following year, two such courses had to be given.

During the second year also, both to promote closer ties between school and home and to help mothers become better teachers of their children, the program developed a series of "home tasks"—things to be made, experiments to be tried, stories to be read,

A PARENT SPEAKS

Following is a slightly abridged version of an interview with a mother who had two daughters in one of the cross-cultural nursery schools. One girl attended the full three years of this NIMH-supported project. The other was enrolled during the final two years and now attends the project's independently-financed successor, in which the mother is a teacher's aide.

Mother: Everytime I talk about it, I get sort of shook up inside because they learned so much, and I have learned so much. I don't

games to be played. One of these was taken to each home each week by a member of the staff, or by students from San Francisco State, and explained to the mother. The following week it was picked up and the experiences of mother and child recorded.

Before the start of the third year, the parents formed the Parent Advisory Council to help guide NICE activities during the final year and to decide the program's future when Institute support ended.

The NICE schools closed in 1969, after three years, and the children went off to kindergarten in public schools. Thanks to decisions by the Parent Advisory Council and the commitment of Mary Lane and her associates, however, the end of NICE was the beginning of CCFC, which stands for Cross-Cultural Family Center. This is an organization with the same goal as the original program—the promotion of interfamily, interracial relations—and a membership comprising 33 of the families who were in NICE and a number of new ones. It operates a nursery school taught largely by mothers who were trained on the job in the original cross cultural schools, and a kindergarten-supplement program for the original NICE children. It also offers afternoon and evening programs for other children and for parents. The Center depends on fund-raising activities by its members and on tuition fees from the children of nonmembers. It is pleasantly housed in the new church school building of the Unitarian Church, in the area served by the original project.

The accomplishments of NICE may be summarized as follows:

1. The children at 5 seemed to be without racial or class prejudice. As a matter of fact, on the basis of observations by project and teaching staffs, the children got along throughout the project

mean only about toys and things like that but the most important—that I have learned how to raise children. Because I sort of talk and raise my girls differently from what I did my older boys. And because I didn't know—.

Here is an instance. I was a very over-protective mother and I'm a very firm mother. Well, in the NICE project I was taught how to help the situation. I used to spank a lot, you know. But I learned you can talk to children—sit down and talk to them just like you and I talk.

Like when we first went to the nursery school. When the children was all 2 and 2 and 1/2, they would hit each other a lot and the teacher would walk up and say: "She doesn't want you to hit her. It hurts when you hit." And I'm just looking and observing. And then when the child would hit again, the teacher would say: "No, that hurts, and she doesn't want you to hit and we're not going to let you hit." It was so fascinating to me, I really wanted to stay every day just to watch how they handled the children.

at least as well as any homogenous group of children. Friendships across group lines were common. During the second year, teachers reported 31 "best friend" pairs. In more than half the cases, these were inter-racial. Since the children were 2 years old when the project began, they have little or no conscious memory of associations in groups of children before that time. They will remember only playing with children of cross-cultural backgrounds.

2. The children made gains in intellectual development, as shown in Table 1. On the Stanford-Binet intelligence scale the average I.Q. gain over three years was nine points—from 102 to 111. On the Peabody Picture Vocabulary Test, which tests a child's understanding of words, it was 24 points—from 90 to 114. The gains in all cases were significant at the .01 level, and there were no significant differences between housing groups. White children as a group went from 108 on the Binet test to 121; black children, from 97 to 103. On the Peabody, white children went from 93 to 117; black, from 83 to 110. These differences between racial groups were significant at the .01 level, with the white children scoring higher than the black children at all time-points. The staff points out, however, that it is impossible to group the children on the basis of a single factor, either race or type of residence, without the other factor entering in. Oriental children were omitted from analyses involving racial groups because there were too few for proper statistical treatment.

TABLE 1

Average IQ Scores by Type of Residence, First and Last Tests						
	Public Housing ¹		Random Housing ²		St. Francis Square ³	
	First	Last	First	Last		
Stanford-Binet	98	103	100	113	108	117
Peabody	83	115	92	108	94	117

¹ Low income; black.

² All income levels; about half black, half white and mixed.

³ Middle income; about $\frac{2}{3}$ white, $\frac{1}{3}$ black.

3. The children made significant gains in social competence as measured on the California Preschool Social Competency Scale.

You would have acted differently?

Right, I would have wanted to say: "Now listen, you know better than to hit," and I would have said, "Now you hit her back!" But that's not the way, I've learned. There was my little girl and another

This scale covers a wide range of behaviors such as response to routine, response to the unfamiliar, following instructions, making explanations, helping others, initiating activities, reacting to frustration, and accepting limits. The national norms for this scale are based on teacher ratings of children in preschool programs. On the first test, the average score placed the NICE children at the 38th percentile; on the last test, at the 78th. The gains were significant for each housing group, and the differences among groups were also significant. Over the three-year period, there was no significant difference between white children, who went from the 41st percentile to the 77th, and black children, who went from the 35th percentile to the 76th.

TABLE 2

California Preschool Social Competency Scale (Percentiles)		
	<i>First Test</i>	<i>Last Test</i>
Public Housing ¹	31	72
Random Housing ²	43	82
St. Francis Square ³	42	78

¹ Low income; black.

² All income levels; about half black, half white and mixed.

³ Middle income; about $\frac{2}{3}$ white, $\frac{1}{3}$ black.

4. The children made significant gains, too, on three scales developed by the project in an effort to gauge three qualities it was trying to instill—basic trust, initiative, and autonomy. Among the housing groups no significant difference appeared except in autonomy, where the St. Francis Square children rated higher than the

little girl, which is a little Japanese, Neisha. Every day this little girl, sometime during the day she would walk over and just hit my little girl. And my little girl would start crying. You know me—I'd say, "This is just killing my ch'ld!" So one day I got so mad about it I went to the teacher and I told her, "Now listen, I'm just sick and tired of my child getting beat up every day," and I said, "Something should be done about it." And the teacher, very calmly: "Well, have you any idea why Neisha hits her all the time?" And I said I'd not even thought about why she was hitting her. And the teacher said, "She wants to be loved." The teacher went on to tell me: "When they are that little, they don't know how to talk; this is their way of communicating with one another. That's it. And the only thing she is trying to tell Mary is: 'I want to play with you. I want to be your friend.'" And within a month and a half those two were playing together every day. But you know, my concept of it was a completely different thing, but the wrong thing.

I wish the project had come around sooner, that my older children wouldn't have had to suffer so much because I didn't know. And I

other groups at all times. When first tested, white children scored significantly higher than black in trust and initiative but not on autonomy; on the last test, the scores for whites and black on each of the characteristics were virtually identical. The three scales are experimental and their validity untested.

5. In their attitudes toward members of other racial and socioeconomic groups, the parents have become considerably more open-minded and accepting. This is the impression of the staff and of persons who talk to representative parents. It is substantiated by an analysis of ratings for each mother on several experimental scales measuring "intergroup acceptance." The ratings were made at the start of the project and again at the end. Over the three years, both the average score of all the mothers and the average score of the mothers in each housing group increased significantly. The groups had the same relative positions at the end as at the beginning: first, St. Francis Square; second, Random Housing; third, Public Housing.

6. The mothers have become more skilled as parents and more competent as members of society. Ratings on experimental scales to measure child-rearing practices and general social competence showed significant increases over the three years. The St. Francis Square group again rated first and the public housing group third.

think that the parent in this project got out of it just as much as these children or even more.

My oldest girl was in the nursery school for three years. Well, I'm just so proud of her in the kindergarten. She's marvelous in her class, and they are getting her ready to read. Because all the stuff that the older children have done, she's had it. You know, too, at times she helps the teacher a lot—to help the other children. And so I'm very proud of my children, those who were in the project. Because they have learned education-wise and they have learned one of the things—.

Just like my older daughter, she can tell the difference between a Japanese and a Chinese. And I can't. Because she has been with these little Japanese and Chinese children. I'll say: "Oh, that's a Japanese," and she'd say, "Oh, Mamma, that's not a Japanese—that's a Chinese!" And this really shocked me because I couldn't tell the difference. But through us having all the different races of the children, and them playing with them —. Sometime you'll kind of look at a child—they're really looking at the child, different from the way we look at it. They look at how the eyes are made, and how the nose, and how everything, you know.

Anybody tell you that?

No—but I sort of learned from my children. Children look at each other in a different way than we look at each other. And then, you know, they'll go up and touch, you know, to make sure that the hair—

Four of the mothers have become assistant teachers in the CCFC nursery; another is in charge of the Center's kindergarten-supplement program; another supervises the after-school activities for older children at the Center. One mother has been employed by the San Francisco Unified School District as a school aide. A mother who was on welfare when the project started has become a secretary to a Y.W.C.A.

7. Through open meetings, social affairs, membership of parents in community organizations, and other ways, the project's influence has extended beyond the families immediately involved. Staff and parents have been called on to consult Head Start staff, participate in panels, appear on TV, and help the State prepare for the 1970 White House Conference on Children and Youth. The NICE schools were used in the training of psychiatric social workers, teachers, home economics students, health personnel, and members of the Teachers Corps and the Neighborhood Youth Corps.

8. Materials useful to other projects concerned with preschool children have been developed. These include descriptions of the home task program, which has been widely followed by Head Start and other projects for disadvantaged children, and of suggested processes and materials for a "multicultural curriculum," and a film, "Swimming in the Nursery School." Two films are

they want to know why is her hair different from mine. And they have to touch it to really feel and see that that is different and everything. So kids is just amazing. And when I started in the nursery I would go almost just for observation and then the more I went, then the more I wanted to go. I wanted to learn. Then I started working in the school with some of the children, which was very rewarding, because you teach them a lot, and you learn a lot from them.

Has it been easier in kindergarten for your girl than for your boys?

It's a lot easier. It's so much different in boys and girls anyway: girls seem to be a little bit more advanced than boys when it comes to learning. But my daughter, she is as much different in her going to the kindergarten than when my sons went as day and night. Because when she went in there she didn't have this fear of being away from me, for a time, because she had learned that, and then she had learned how to play with other children and she had learned all these different kind of peoples. Just like a teacher in kindergarten is a Japanese and they have an aide in there that's a Negro. Well, she goes in and she doesn't even think about race or why is a person different.

She notices that —?

In the NICE project, even when they was two and a half and three they noticed. And they wondered and they questioned the teachers to some length about why, you know. You know, just like the cartoon—

being developed from NICE video tapes—on the introduction of a child into an ongoing program and on the use of cognitive materials to stimulate thinking. A series of pamphlets on various aspects of the program is planned.

If money becomes available, the team that directed NICE—Mary Lane and two research associates, Mary S. Lewis and Freeman F. Elzey—expect to follow the NICE children through the fifth grade of public school.

Birth of NICE

One day eight years ago, Mary Lane received a telephone call from an acquaintance of hers, a young mother who had recently moved into St. Francis Square. This is the cooperative apartment development, for families of middle income, that in 1962 replaced several blocks of old, three-story houses occupied mainly by low-income black families. Other blocks of similar houses had been torn down earlier to make room for luxurious high-rise apartments. The San Francisco State professor, an authority on the education of young children, was asked to talk with a group of "the Square" parents about the troubling experiences they were having.

Dr. Lane knew that the development had been planned as an integrated community for people committed to inter-racial living and that, while the majority of the residents were white, a number of middle-income black families lived there, too. She now learned that many, probably most, of the parents in the Square felt frustrated and rebuffed. They had moved in considering themselves liberals in racial matters and eager to get along with the black people in the surrounding neighborhood, mainly in public housing. But facilities in the development such as laundry rooms and playgrounds were being vandalized, and children from the Square were being attacked and chased home from school by public housing children. Further, a group of parents had started a cooperative nursery school in a nearby Y.W.C.A. and had hoped that some of the black public housing residents would participate, thus giving children from the Square an opportunity to associate with other children who would be entering kindergarten or first grade with them. The public housing people had not responded. Residents of the Square were beginning to feel themselves on an island surrounded by hostility.

they would rub the black children's skin; they would just rub it to see would it come off. And then they ask a lot of questions. Just like in my daughter, she wanted her hair to be long like Enrica's hair, and so I had to press hers out so hers would be long like 'Rica's hair.

The Square children, Dr. Lane was told, were doing very well in elementary school, where almost all of the pupils were black. The teachers liked the newcomers and were pushing them ahead. "And," one mother reported, "27 of us have been appointed room mothers!" Apparently it had not occurred to her to wonder about the women who had been the room mothers before. And apparently it had not occurred to most of the parents to wonder how public housing people might feel when they looked out of their stark concrete dwelling place and saw the Square—with its attractive buildings and the neighborhood's only grass and shrubbery—occupying the site where they or relatives or friends once had lived.

Says Dr. Lane, "I thought to myself: *Here are all these middle-income children—200 preschoolers alone—in the Square. And here are all these children in public housing. How wonderful if we could get a cross-cultural thing going, and see if we could break down some of the barriers.*"

A family-centered nursery school for 2-year-olds would be an ideal "cross-cultural thing," she felt, because even people of the most diverse interests, if properly approached, would surely work together more or less harmoniously for the welfare of their children. And working together, they would learn to understand and appreciate one another. Their children would accept inter-racial activities as a matter of course. Additionally, the children from disadvantaged families probably would enter the public school system, after three years in the nursery school, much better prepared intellectually and emotionally than could be expected otherwise.

With the moral support of a number of community organizations and financial backing from NIMH, through a grant to the College, Dr. Lane spent a year developing her ideas, finding sites

Do they ask questions of you?

Yes. Because they are interested in things. And there she was, sort of questioning. She'd say: "Am I really a black person or am I a blue person?" The way I feel about it she is a Negro, but sometimes other people call the Negro a black. And then she said: "Well, I think I want to be a Negro." I felt kind of fine. You know. And after the questions, it wasn't no problem at all. They played with each other. They'd even come and they'd say: "I'm a Negro, or black," and "You're a Caucasian," and "You're a Japanese," and "You're so and so."

How did the teachers explain?

Well, they'd say at times: "Some of us are one way and some of us the other, you know, but we're all human beings because we are all boys and girls."

for the schools, talking to families with children of the right age (only two such families declined to enter their children), and selecting and training the teaching staff. Assisting her through the life of the project were the research associates mentioned earlier, Freeman Elzey and Mary Lewis. The three worked together as a team, Elzey designing the research projects and analyzing results, Mrs. Lewis conducting the interviews and creating the home tasks program, and all three sharing administrative duties. A psychiatric social worker, Stanley Seiderman, joined the staff some months after the schools opened and became a part of the team in a counselor role.

Key Philosophy: Complete Acceptance

Members of the teaching staff faced more problems than usual because, in addition to being teachers, they were expected to act as counselors to parents and researchers, a function that obliged them to make daily notes and write a weekly record of both child and parental behavior. During much of the first year, too, they sometimes found themselves acting as social workers, guiding low-income families to medical, housing, and other community services. Even after a social worker was added to the project staff, some of the families preferred to take their troubles to the teachers. A summer of intensive training preceded the opening of the

I was prejudiced before I went to the nursery school. Because when my older sons would come home and would talk about their friends, I would say: "Is he a Negro or white?" And one day my oldest asked me: "Well, Mamma, what difference does it make?" And that gave me something to think about. And then I said: "Well, really what difference does it really make?" And then I stopped asking him that.

This NICE project has helped me to overcome my prejudice, because we often have discussions and one discussion was on prejudice, and I think three or four sessions were on it. And at the first meeting, everybody was sort of, you know, not really saying what they really feel. So, Mrs. Lane, she was there. "Now," she says, "You should be fair—you really feel one way or the other about it." And by the time we got to the second meeting, it really came out, what you really feel. And then we learned about each other. I'm prejudiced to a certain extent. Here's you; you are prejudiced to a certain extent. Because it brings you back to how we was raised. You know, and do we want our children to be raised this way? Well, we don't want our children to be raised this way.

Are you from San Francisco?

No, I'm from the South. Houston. And I remember one of the things that used to hurt me—when my mother would say Yes, ma'm and No'm to a 12-year-old Caucasian. That used to break my heart, because that isn't right, you know. *How're you . . . How're you. . .*

schools but could not altogether prepare the teaching staff for what lay ahead.

Probably the most important feature differentiating these cross-cultural schools from other nursery schools was unconditional acceptance of the parents as well as the children. It was also the teachers' heaviest burden. Unconditional acceptance meant, for one thing, putting up cheerfully with lackadaisical observance of schedule. Children and their mothers were welcomed any time they arrived. Mothers who wanted to take children home before the session was over were permitted to do so. Mothers who failed to pick up their children on time found them being cared for.

More disturbing practices also were accepted. One mother spanked her 2-year-old daughter for wetting her pants. One father, finding his boy reluctant to leave at the end of a session, took off his belt and threatened him. A woman, watching her son, not yet 3, color a picture, insisted that he stay within the lines. In each case the teachers felt shivers running up and down their spines but said nothing.

In staff meetings, where problems associated with unconditional acceptance were often raised, Mary Lane and her team took the position that if parents were ever to be open to change, in either child-rearing practices or racial attitudes, they first had to be accepted as they were. Some staff members found it harder than others to go along. One head teacher left after a few months.

Before the end of the first year, the staff had evidence that the concept of complete acceptance was paying off. Families were changing their time habits to conform with the schedule of the schools. Parents were asking teachers why they didn't punish the children for wetting themselves, threaten them for not doing immediately what the teacher wanted, insist on neat performances. And the parents were beginning to listen to the answers.

And as a child coming up, it would break my heart, because we were taught at home that you respect age. And you know, I could understand that. But a person younger than me! And I would ask my mother, but she never could really explain to me, to my satisfaction. Or she'd say: "Well, you have to," or "That's the rules." And I have always questioned things like that.

There were things that came out during the group discussions here, that one race don't really know what the other one really thinks until you really get down and start talking about things. Because just like some of the white persons would say they were taught you shouldn't marry out of your race and everything, and a whole lot of this *your parents don't want you to*. And they were shocked to know that these Negro parents didn't want their children to marry out of their race. You know, and different things like this.

Making the Parents Welcome and Useful

When the three schools opened, parents were invited to stay with their children as long as they wished or felt it necessary. Each school had a parents' corner, fitted out with comfortable chairs, coffee-making materials, and magazines. Some of the mothers delighted at the opportunity to watch their children and to talk with other adults lingered half the morning. After a while the "bag lunch" became an institution. On a certain day each week, mothers would drop in with a lunch bag during the morning and stay to observe the rest of the session and to eat with the staff. These informal get-togethers gradually moved from general talk about children to guided discussions of such subjects as sibling rivalry, art activities in the home, discipline and toy selection.

Mothers became more and more deeply involved in school operations. After a few months some of them were asked to volunteer as additional aides because, even with one or two student teachers in each school, the ratio of adults to 2-year-olds was not high enough to give the children as much individual attention as they needed. Later, with the approach of summer and the departure of the student teachers, all mothers were asked to serve one day a week during the summer session. Most of those whose time was not otherwise committed agreed. They were invited to bring along their children, so the workday became also a family outing day. The following fall, Dr. Lane explained at a parents' meeting that writing research reports and attending teachers' meetings required a sizeable amount of the teaching staffs' time. So one day a week the schools would close unless the parents could take over.

I owe a lot to this project. I had a distrust for professional people, you know—that they were one way, and you were another way. But then in this project I learned that although they are professional people they are just human beings, like I am. You know, we call the staff by their first names, and everybody always looks at me when I say Mrs. Lane. Most of us call her "Mary," but I don't know—I have so much respect for her. I just come from old-fashioned teaching that when you really respect a person, and admire a person—. When I say, "Mrs. Lane," well, this is my way of saying I respect her as a person for what she stands for and the things that she has done. It's not because there is a difference in race or anything like that; it just comes out of respect. I suppose there is something in me that I just can't come to call her "Mary." I just can't.

I would just like to see that this family center could be continued, because I think it has helped my children and so many of the children that need help. And not only the children, but the parents. There was one mother in particular. Her children were enrolled in the nursery

Teams of mothers signed up to do this, each team obligating itself for one day a week for six weeks.

Home Tasks

At the end of the first year, project staff members and teachers wondered what else could be done to bring home and school together. In about half the families, parents rarely visited the schools except to drop off or pick up the child. And some of the parents who did stay longer were either uninterested in or puzzled by what was going on, in spite of staff efforts to communicate. These were parents who in the main thought of learning only in terms of reading and writing. Some way of getting into the homes and talking to the mothers individually seemed necessary if NICE was to be sure it was reaching at least most of the families. The staff decided on an educational intervention scheme it called the Home Task Project.

Home Tasks would help parents see and make use of the learning potential in the play activities of their young children. Parents then would have greater understanding of the school's task and of the way the school uses materials to help the child learn. Also, by working with the child a few minutes each day, the mother would begin to view herself as the child's teacher as well as his mother.

Mary Lewis spent the summer developing the home tasks and the explanatory materials to accompany them. The tasks were designed to extend knowledge, sharpen perception, develop motor skills, or expand concepts. They included seeds to be planted, a scrapbook to be filled, a plank to be balanced on, picture books to be looked at, puzzles to be worked, pieces of wood to be joined, drawings to be colored, games to be played and a turtle to be cared for. At Halloween every family would get a pumpkin along with a recipe for pumpkin cookies, a candle, and a list of suggestions on how a pumpkin could be used to help the child grasp such concepts as round, orange, hard and hollow. Altogether 60 such tasks were developed.

Every week at a regular mutually satisfactory time, each home was visited by a member of the staff or a student teacher bringing the week's task and typewritten instructions for its use. The visi-

school, and the first two years she wasn't really concerned about taking care of them. You know—their eating right and things like that. And since working with the NICE project and the teachers in it, I have seen a big change in her. She's a completely different person. And then you ponder. You see a parent that don't care, and after three years, this parent has just turned about. It's the sort of thing that makes you stop and think.

tor demonstrated the task, explained the instructions, and discussed the educational value. A bean bag game, for example, was intended to develop not only eye-hand coordination but also such space-relation concepts as inside, outside, to the right, to the left, over, and in front of. A "feel kit" included the book, "What Is Your Favorite Thing to Touch?", a bag for holding small objects to be identified by touch and instructions for playing the "comparison game," in which the child is encouraged to name things that are "as smooth as — —," "as sticky as — —," "as soft as — —," and so on. One task called for mother and child to take a short walk, talk about what they saw, and draw a rough map locating some of the things seen. Mothers were encouraged to use the tasks with their children at least once a day. The following week the visitor returned with the next task and asked about the child's experiences with the last one and the mother's ideas for expanding its usefulness as an educational item. Expensive items such as books or puzzles were picked up for delivery to other families.

The staff reports that the home task project, which continued through the second year and 18 weeks of the third, was not without headaches. Items were lost, broken, or kept for longer periods than scheduled and visits were missed because of forgetfulness either by the visitor or the family. From the comments of the mothers, however, the staff believes that the project succeeded both in drawing parents closer to the schools and in demonstrating the potential of the parents as teachers. Visitors reported increasing interest on the part of most families. Many mothers reported that home task day had become a special occasion for the whole family. Even middle-class mothers were surprised at the variety of ways open to them to develop their children's abilities. After each visit certain information was recorded on IBM cards. It is now possible to determine, among other things, which tasks were most used and how a given task was regarded by mothers and children.

A Training Course for Parents

At the request of mothers who said they would like more information on how to work with young children, the project staff decided midway through the second year to offer a course in pre-school learning and education. It reasoned that such a course would make the women both better mothers and more competent aides at the schools. Mothers were told the course would run two hours a week for 15 weeks and that they would be expected to work one day a week in the nursery. Out of 32 mothers who were not working, 15 signed up—8 of them black, 4 white, and 3 Oriental.

Asked by Dr. Lane, the instructor, why they wanted training, those who signed up said they would like to learn, among other things:

To talk to my children so they will want to mind.

To get rid of the feeling that I can't handle my child.

To read books with more feeling.

To stay calm.

Educational spots in the city for children.

What to expect of children.

To understand myself better.

The mothers were asked to take notes; readings were assigned and reported on; small groups were formed to make a special study of one area of interest chosen by the members (such as books, trips, toys); and each mother had a semester project—to study and report upon one child, not her own.

To set the tone for the course, Dr. Lane wrote each mother a letter in which she said, in part:

You are your child's most important teacher. Did you ever stop to think what life-long learnings come from you? First of all, he learns the *feel* of mother as you feed him, change him, bathe him. He remembers this always. From you he learns how much he can trust the world.

Then he learns his language from you. His voice tone and the way he pronounces words will be much like yours. What he first talks about will be what he has heard and seen at your knee.

Very important is what he learns from you about how you feel about people. If you are friendly and helpful and think people are pretty fine, he is likely to feel this way, too.

He learns very early from you how you feel about *him*. If you feel your child is just great for a two- or three-year-old, he'll feel great about himself. These attitudes that he "catches" from you when a child, he is likely to keep for all his life. . . .

The course included sessions on child study, art activities, music and fantasy, books and story-telling, educational trips and toys, and science. Dr. Lane or another San Francisco State faculty member would discuss the topic and answer questions. Then a few of the weekly reports written by the mothers as part of their semester project—to observe a child—would be read and discussed. During the following week the mothers were expected to try out in the schools something they had learned during the session. If the topic had been music, for example, they were asked to lead a small group in a song or a dance.

"I thought we were just going to learn from Mary Lane," says one mother, whose views of her experiences during the course

were typical. "And that would have been fine. But we learned also from each other. One of us would have a problem with children, and we'd lay it in front of everyone, and people would come up with some very good ideas. You learn ten times more with people sitting around a table with you. You let all your feelings out, and everybody gains."

The course was so popular that next year Dr. Lane offered it again. And, to meet the demand from working mothers, Mrs. Lewis offered a similar course in the evening, which was attended by a few fathers as well as by mothers. All in all, about 35 parents took one of the courses and earned credits from the extension division of San Francisco State for doing so. The credits were appreciated particularly by half a dozen of the mothers who wanted to work in day-care centers and had to meet the requirements for a license.

Developing Self-Esteem

In the beginning, NICE made no effort to develop a cross-cultural curriculum for its children. Since the project was serving a cross-cultural population and had a cross-cultural staff, it assumed that the curriculum was bound to be cross-cultural. The staff put its conscious emphasis on developing skills—perceptual, motor, cognitive—and trust, autonomy, initiative, and social competence.

Because many of the children had culturally poor backgrounds, the project did place more than the usual emphasis on building self-esteem—on helping each child see himself as someone special and as a member of a special family. The staff followed a number of fairly common procedures, such as hanging a full-length mirror low enough for children to see themselves, using the children's names in talking and singing, and identifying and exhibiting work produced by the children. Going farther, the teachers also gave special attention to children with markedly low self-esteem, sometimes even assigning one staff member to care exclusively for one child. For example, a student teacher was assigned to Buddy, who was too fearful to talk or even, at snack time, to reach out for a glass of fruit juice. The teacher took him on walks, read to him, played with him. Half a year later, Buddy was talking a blue streak but articulating poorly, so the staff guided him and his mother to the college's Communication Disorders Clinic. By the end of the year, Buddy's self-concept had improved dramatically.

For deepening and expanding a child's good feelings about himself and his family, NICE regards photography as its most important activity. Each school had a simple camera, which the teaching staff was encouraged to use for portraits, candid shots, and group activity pictures. Since the project had access to a dark room at

the College, processing was inexpensive. The schools usually had many pictures on display. In one school, children's photographs were used to identify lockers; in another, each child had his own bulletin board, on which were displayed his photograph, samples of his work, and group photographs of classmates. All the schools displayed family pictures. The photographs were often the subject of discussion among children, teachers, and parents.

Special events such as birthdays, picnics, and trips were photographed and the prints put on display for use as learning materials. And occasionally pictures taken a year or two earlier would be brought out for comment. "When a child has an opportunity to see himself in this way through time and space," Dr. Lane comments, "he views himself as a changing person. We feel he gains a sense of openness about himself and his potential. These are important factors in the self-concept."

During the second year, families, teaching staff, and children cooperated to produce a "Self Book" for each child. This was a collection of photographs that the child wanted to have in his own book, together with his own comments about them. Each book began with a photograph of the child and a typed transcript of the story he dictated about himself. Then came other photographs—usually of members of the child's family, his teachers, and his favorite toys. The photographs at home had been taken by someone from the school in accordance with the child's wishes. With each picture was a story the child had dictated. The Self Books were kept in school. Often a child would ask a teacher or a parent to read to him from his book; he would listen delightedly. From this project, Dr. Lane is sure, the child learned not only that his family was something special but also that someone cared enough about him to record what he said.

Later, staff members and parents under the guidance of Mary Lane produced for each child "My NICE A B C Book," which opened with his photograph and included, under F, a photograph of his family. Each of the other pages had a verse about one of the letters of the alphabet, together with photographs of the children or teachers whose first name began with that letter. Thus a child could learn the ABC's and at the same time the names of all those who shared with him three years in the nursery school.

A Cross-Cultural Program

It was apparent from the start that some of the children noticed differences in one another, for they would feel another child's hair as though to verify its differentness, and touch and comment on each other's skin. Late during the second year, when the children were approaching their fourth birthdays, the teachers noticed that

they were becoming more consciously aware of differences, or at least talking more often about them. One noon as one of the black mothers was leaving school with her daughter—after a session in which the music hour had included a song about black being beautiful—the little girl said: “Mommy, you and I are white, aren’t we?” She was one of several black children who identified rather strongly with one or another of the white teachers. On the other hand, one of the white boys kept telling his mother he wished he were “dark, like Michael,” because he liked Michael very much.

So the staff began thinking perhaps it should be paying more conscious attention to the cross-cultural elements of the curriculum. The feeling was that children should not only become aware of differences between one ethnic or cultural group and another but also come to accept and appreciate these differences. In addition, a child’s image of himself and his family should be tied to that of his group. As Dr. Lane puts it: “We hoped each child would come to feel that ‘I am Bobby Lewis. My folks are the Lewis family. And the Lewises are—black, white, Oriental, mixed, or whatever.’”

Parents were urged to attend staff meetings to talk about these goals and what more might be done to attain them. The parents were to constitute the Parent Advisory Council. Only nine accepted, but these were outspoken in their comments. For example:

“There are people I don’t want him to identify with, no matter what color they are—people, you know, of lower character.”

“How can you explain to your child that you get angry with people in high office and that you don’t like a certain person even if he is President?”

“Yeah, it’s hard to build respect, especially in a black home. They’re always talking about bad white people—they do this to us, and they did that, and we’re going to get ‘em. Like she knows somebody white killed Martin Luther King, but she’s kept her white friends.”

“You know, it’s a funny thing, I never even thought of it that way myself—a white man killed Dr. King, but I guess it’s a way of thinking about it. I think I would say it was an individual not a white or black man, and it’s wrong no matter who did it.”

“I think the children need to know blacks do bad things and they do good things, just like white people and pink people. But I think when my little girl sees a black do bad things she thinks it too bad.”

“Well, I want my kid to feel good about herself and if she does that, maybe she won’t have to hate other people.”

All of the parents were kept informed of the Council's discussions. The attending parents, as well as some of the others, contributed ideas for the third year's program. In the end, the staff had many suggestions for ways of teaching differences, particularly in matters of food, dress, games, customs, and holidays. Through its own research it also had a list of books and another of recorded music and songs from many cultures, considered appropriate for prekindergartners.

As the result, the third-year program included:

- Development of a multicultural calendar that marked such dates as Martin Luther King's birthday, Chinese New Year, Japanese Children's Day, and Jewish and Christian holy days. The calendar was intended primarily for home use, but some of the special days were observed in the schools.
- Visits to the library during Negro History Week to see an exhibit of photographs of people around the world.
- Showing of a moving picture about a black boy and a white boy attempting to span an ocean inlet by building a bridge together. ("Bridge Tomorrow," written, filmed, and produced by Oscar Williams, San Francisco State College.)
- Displays of photographs of prominent people—white, black, Oriental.
- Games and songs from different cultures.
- Exchange of recipes among the mothers and the sharing of characteristic dishes—such as chittlings, teriyaki, sweet and sour pork—at the weekly school lunches.

Services for the Family

The teachers frequently encountered problems that could not be handled with simply a few minutes of advice. For instance, a mother was sick, and her family needed homemaker assistance; a marriage was on the rocks; a family had to move but could find no place to move to; a credit agency was threatening suit; an older child was in trouble with the police. Particularly during the first half year teachers often spent part of their afternoons, which had been set aside for planning and report-writing, and even some of their free time, consulting with such families and bringing them together with the appropriate community services.

The addition to the staff of a psychiatric social worker eased the situation. He acted as a consultant to the teachers and a counselor and advocate of the families requiring help. With the aid of two graduate students in social work, he studied the public resources of the area—health, employment, legal aid, and the like—and told people about them in a meeting to which the parents in particular were invited but which was open to all. A number of the poorer

families hadn't known what was available to them almost next door, free.

During the three years of the NICE schools, the project helped 35 families to deal with specific mental health problems through counseling by the social work staff or action by other community agencies, or both. About two-thirds of the cases were child behavior problems, half of them involving nursery school children and the other half, older brothers and sisters.

In other ways, too, the project became involved with a family's older children. For boys whose parents said they needed something to do, it organized a club led by students in educational sociology at San Francisco State. One activity was going to baseball games with their fathers. If a boy's father couldn't attend, the boy went with another father in the project. A black boy might be picked up by a white father, a white boy by a black one. Other activities included trips on foot or by bus to interesting places in the city. For older girls, the project formed the Girls' Friendship Group, which met weekly with a student leader. For a dozen older children who were having trouble in school, it procured tutoring by student teachers. During the project's last summer, the social work staff arranged for 19 youngsters to attend good, small camps.

In addition, the schools provided intervention almost continuously and as a matter of course as the teachers identified special needs. If a child always hung back from group activities, he was encouraged in a number of ways to join in. If a child lacked a male model at home, he was chosen more often than others to go with the man teacher to buy fish for the aquarium or food for the guinea pigs. If a child just sat and looked blank, though his hearing was normal, teachers made sure that some smiling, interested person was near him, often talking to him. Because staff members knew children and families so well, the project estimates that all but half a dozen families received special help directly related to mental health.

The project was concerned with physical health as well, the purpose being to see that each family knew how to get the medical services it needed. To this end, the project required annual physical examinations for both children and mothers, and when necessary it guided the families to facilities where the examinations—and any treatment required—could be obtained at little cost. It won the cooperation of the Health Department in providing vision, hearing, and dental screening services. It arranged for a comprehensive serology test of all the children, primarily to screen for sickle cell anemia, which has a relatively high incidence among black people. Several children were found to have the condition

and their families were helped to get the necessary medical care. The project arranged also for parents to participate in several discussions of cancer.

Other activities included:

Swimming classes for nursery school children and their older brothers and sisters.

A dancing class for mothers.

Swimming parties for mothers.

A sewing class for mothers, with aid and instruction from home economic majors at San Francisco State.

An art class for mothers and fathers.

Moving pictures on family life and education.

A monthly meeting for mothers, where the topics discussed included, "Prejudices and How to Discourage Them," and "What Advice Would You Give to an 18-Year-Old Mother-To-Be?"

School and tri-school suppers and picnics.

Involvement in the Community

The project was alert for ways to facilitate the involvement of families in community affairs. One opportunity occurred early when the play yard of the Westside Courts Nursery School was subjected to vandalism, including the partial burning of a playhouse. At a meeting of the residents of this public housing unit, quickly arranged by the staff, people who were not members of the project had an opportunity to voice hostility toward the school for serving "white kids" as well as black. And parents with children in the school had an opportunity to explain the goals of the project and thus win for it greater acceptance by their neighbors.

Beyond that, the discussion brought out a legitimate grievance: the lack of recreational facilities, particularly for children from 9 through 13, who seemed to have done most of the damage. Through the efforts of the head teacher, a second meeting was attended by the staff of a nearby neighborhood center and arrangements were made to bring Westside Courts youngsters into that center's recreational program. As an outgrowth of this experience, staff and parents worked with community leaders to obtain better planning for the use of a small park for the Westside Courts area and became more involved in the Police Community Relations Program. Also, one of the teachers at the nursery school started a woodworking class for older boys and this developed into a club for young teenagers, girls as well as boys. The burned playhouse, incidentally, was rebuilt and the other damage repaired by a group of the fathers—black, white, and yellow—in the course of a "work Saturday."

During interviews with staff members before the nursery schools opened, many of the parents—of all the ethnic and socioeconomic groups represented—expressed concern about the area's public school facilities and programs. So a Public Education Committee of parents and staff members was set up. It arranged for meetings at which school issues were explained and discussed; organized a program of parent-school visits, under which parents visited the kindergartens their children would attend; and sent representatives to meetings of the city's School Board. The Committee became an area-wide group.

One mother—black, six children, on welfare—represented NICE as a board member of the Mental Health Consortium, formed to work for better use of the area's mental health facilities. Another participated in a charrette, a community-based meeting open to the expression of the residents' wishes and complaints, organized by the Far West Educational Laboratory. The social worker represented NICE on a community planning group, where he helped develop a program for the sick children of working parents.

Breaking Down Boundaries

Several months after the schools opened, a white couple invited all the other parents from one of the schools to a party in their home in St. Francis Square. It was the first parents' party. One black couple from public housing decided not to go because they could not believe they would be welcome. Another got as far as the host's door. "If anybody looks funny at me when they open the door and see who's here," said the man to his wife, "I'm turning around." Today, according to staff members, the idea of rejection would never occur to any of the parents because they have come to trust one another.

The development of trust was a rather slow process. Until the schools had been in operation a year, there was little mingling by the parents across either racial or income lines. The mixing process speeded up during the first summer, when more of the mothers were helping at the schools and getting to know one another better, and whole families were being thrown together at school picnics. During the final two years, middle-income parents, who were predominantly white, habitually picked up low-income parents, who were predominately black, and took them to parents' meetings and other activities. And some of the women with a car in the family organized car pools so that working mothers, generally from low-income families, would be saved the trouble of getting their children to and from school.

Comments from parents tell this part of the story best.

One mother who had never associated with white people ("oh, we had little friendships in school but it was always kept in school, you know—they didn't come to visit me at home and I didn't go to visit them at home") found herself liking almost everybody she met in the project. "And, someway, it's not a forced like: I've gotten to know them and it's a real friendship—not just having something to talk about, mostly school. They like me, and I like them." She and her children go to dinner at white families' homes and the white families and their children go to dinner at her home.

"We are meeting people on a social level that we wouldn't have met before, except possibly on a business level," said a professional man of Chinese ancestry. "This is the most magnificent part of it." He recalled the first time he and his wife had been invited to a social occasion—an anniversary—at the home of one of the black families. The father managed a clothing store. "The thing that struck us very profoundly," said the professional man, "was that these people have as much capability as I have, yet they are not able to live nearly so well for their efforts as I am. And there are many black families who live even less well—in one of those very inhuman monoliths that architects have created to house those families. When you get them that kind of housing, how can you expect high-class citizenship performance?"

Said the wife of a lawyer: "We didn't go out of our way to solicit friends among the parents, just as we don't go out of our way to solicit friends among our neighbors. It was just a natural happening, and it took time. It's genuine." Her husband noticed a couple of plainclothesmen looking on at a fund-raising dance given by the new Cross-Cultural Family Center. "It must seem odd to them," he remarked, "this peculiar mix of people having a good time, drinking and dancing and talking and laughing." His wife reported: "It was really beautiful."

Another mother, asked what she thought of cross-cultural education, said, "I think it's wonderful, because I think that's the answer to everything—all the problems that we're having now. The more you are together the more you really know it's no mystery. . . . You find out that people are actually doing the same things and having the same type problems, regardless. You really find that out."

One woman said that even before NICE she had been acquainted with a number of people different from her. "But I just didn't have—I'd say 'Yeah, it's a nice day,' and I'd be finished." She mentioned a nursery school mother who had been born in Japan. "One day I met her in the wash house, and we started talking. She was the sort of person I could say, 'It's a nice day,'

and we were finished—after that—I don't know what it was. I think it was a change in both of us. The races don't make too much difference—it depends on how they act. That should be a thing we should remember. She talks about the classes where people were talking about how they grew up and what happened to them—their way. And I sort of look at a lot of people and say, 'Yes, that's how you become you are what you are.' And that helps. It just helps in knowing a lot of people in general." This mother said she was joining the Family Center because "I might learn to know somebody else that I didn't know this year at all."

The New Family Center

The nursery schools closed in the summer of 1969, as scheduled, and that fall the Cross-Cultural Family Center opened as the successor to NICE. The Parent Advisory Council and the project staff had spent half a year planning for it.

The two biggest problems had been where to locate the Center, since none of the school sites was adequate, and how to finance it, since NIMH was unable to continue support. The site problem was solved providentially. Some of the nursery school parents appeared on a television program, dealing with battered children, and told what they had learned from NICE about child-rearing and children's education. Impressed, members of the Unitarian Church, which had recently finished building a new education center, asked what the project was going to do next, and offered the use of classrooms, play space, and an auditorium. The church representatives explained that NICE, more than some other worthy organizations which had been considered, seemed particularly able to carry out the church's commitment—to use its new plant for the good of the community.

Some members of the project staff were not eager to accept. Dr. Lane, notably, felt that being in a church might put a damper on activities. She also felt that the superior, almost luxurious, facilities being offered might intimidate some of the persons who would be using them. She expressed herself at a meeting of the Parent Advisory Council and suggested that the search for a location be continued. The Council voted her down. One member remarked: "It won't take me long to get used to a little luxury." Dr. Lane soon felt altogether happy with the decision.

The financial problem was tougher. For the first year it was met largely through contributions of time and talent by parents and by members of the original project staff from San Francisco State, and through money raised by cake and rummage sales and by benefits—a dance, a concert, a fashion show. The fund-raising efforts were so extensive and exhausting that for 1970-71 the

Center decided to operate the school in two sessions, morning and afternoon, and to admit children of non-members and charge tuition for them. Fund-raising efforts are still necessary but should be less arduous. Some members of the Center are opposed to this direction but have been unable to suggest a viable alternative.

The head teacher of the Center's nursery school was an assistant teacher in the original project, and her assistants are mothers who were trained as part of that project. The Center's activities include a kindergarten-supplement program for the original NICE children three times a week; individual tutoring in the afternoon for elementary school children who need help in order to keep up with their classmates; afternoon classes in sculpting, dancing, and science for children of 6 and older; and evening classes in cooking and sewing for children of 10 and older. For boys and girls from 7 to 10, there are clubs that meet weekly. For adults, there are discussion groups, pot-luck suppers, occasional socials.

The Parent Advisory Council for the NICE schools became the Board of Trustees of the Family Center, which is a non-profit corporation. The chairman of the board, a man of Chinese ancestry, says: "The three years of the nursery schools simply started something that we expect to grow—to become increasingly more beautiful." Another member, a black woman, adds: "The Family Center speaks stronger and louder about the value of NICE than anything we can say."

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Long-Term Effects of LSD-- A Follow-Up Survey

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The studies of Dr. William McGlothlin and his associates have shed light on several controversial aspects in the use of the hallucinogenic drug, d-lysergic acid diethylamide—LSD. In order to gather information about the drug's long-term effects, the investigators surveyed a large group of people who received LSD under medical supervision approximately ten years ago. Their analyses uncovered no evidence to support the claim often made by LSD advocates that the drug produces lasting changes in the user's personality, beliefs, and behavior. Nor did they find any evidence to justify the fears of those who oppose any use of LSD because of its potential for chronic abuse. On the contrary, in piecing together the first comprehensive picture of the pattern of non-medical LSD use among white, adult Americans, the researchers discovered that most tended to decrease rather than increase their LSD use over time.

The UCLA scientists also investigated the outcome of the pregnancies that occurred in their population sample from the time of the initial LSD administration to the time of the survey. Their findings suggested that the risk of spontaneous abortion may increase if a woman uses the drug prior to conception.

Finally, the researchers measured brain functioning in a small subsample of the population, a group composed of heavy users of LSD. In this area they found no evidence of generalized brain damage, but some indication that heavy use of the drug is associated with below-normal performance on tests of abstract ability.

The Population and the Methods of Survey

The researchers drew their population of LSD users from the records of three psychiatrists who, during the 1955-61 time pe-

riod, had given the drug to patients whom they thought it might help and to psychiatrically normal volunteers participating in clinical studies. From a total of approximately 750 people, 300 were selected randomly for the follow-up survey. The investigators were able to locate 284 and interviewed 247 (12 were deceased, 9 were outside the United States, and 16 refused). Half had received the drug in experimental work and half in the course of psychotherapy.

Each respondent was contacted personally, interviewed in depth and given a detailed questionnaire to complete. In the interview he was asked to describe at length his recollections of the short- and long-term subjective effects of his experience with LSD. In addition, background information on family, health, work history and the like was supplied, as was a history of drug use. The self-administered questionnaire consisted mainly of various psychological tests designed to reveal something of the respondent's personality and his basic attitudes and values about himself and his world. The interview and questionnaire were the sources of the study's data, which the researchers used to construct composite pictures of the whole sample and of various relevant subsamples.

Characteristics of the Sample

As might be expected, this group of people was found to be well-above average in education and income: slightly more than half held at least one college degree and two thirds had annual incomes greater than \$10,000. Compared to a random sample of the U.S. adult population of the same age—at the time of the survey the mean age of the study sample was 44 years—the group included disproportionally large numbers of physicians and psychologists, artists, writers, and entertainers.

Most of the respondents, 77 percent, had received LSD a total of 1–5 times; 16 percent had been given the drug a total of 6–20 times; and 7 percent received it more than 20 times. The median value of the usual single dose administered by the physicians was 125 micrograms (millionths of a gram).

Extent and Patterns of Non-Medical LSD Use

The researchers found that 23 percent of the sample—40 men and 18 women—took LSD on their own after their initial experience in a medical setting. Thirty-six people had used the drug less than 10 times, and 22 had used it on 10 or more occasions. The median value of the dose usually taken was 125 micrograms.

The non-medical users were sorted into two groups on the basis of their use of other drugs prior to their medical experience with LSD. One group of 24 could be described as drug-prone, having a

history of psychedelic drug use (e.g., peyote and mescaline) and or substantial marihuana use before their medical exposure to LSD. The remainder, 34 people, had never used such drugs before their medical experience. The groups were then compared in terms of the following variables.

Current use of other drugs. The two groups of non-medical users were compared with each other and with the group who had no non-medical experience with LSD, in terms of their current use of such drugs as alcohol, tobacco, stimulants, sedatives, and hallucinogens other than LSD. The drug-prone group could still be described as drug-prone in comparison to the second group; that is, it still showed substantially greater use of all drugs. On the other hand, those who were not drug-prone before their LSD experience, yet sought out additional LSD on their own, did not differ in their use of drugs (excepting only LSD and other hallucinogens) from the respondents who did not seek to use LSD again after their medical exposure to it. This suggested that the LSD experience, even if sufficiently valued to be pursued outside a medical framework, did not affect willingness to use drugs generally for mood manipulation.

Motivation for further LSD use. A large majority in both groups said that they had undertaken additional LSD experience for purposes of self-exploration. Nearly one third of the drug-prone group compared to 12 percent of the other group gave their motivation as a search for pleasure and euphoria.

LSD use over time. The researchers found that in general LSD use tended to decrease over time. This tendency was even more evident in the group that was not drug-prone, but it was clearly visible in the drug-prone group as well. Only 18 people in the group of non-medical users had taken LSD in the year prior to the survey. Moreover, 35 people said they did not plan to use the drug in the future.

Reasons for continuing or discontinuing. Most of those who intended to continue using the drug (23 totally) gave self-exploration as the primary reason for doing so; four individuals of the non-drug-prone group specifically mentioned the desire for mystical experience as their reason for continuing. The groups did not differ markedly on reasons for discontinuing use: the two reasons most frequently offered were a concern about "bad trips," and a loss of interest in further LSD experiences.

In sum, the pattern of non-medical LSD use as outlined above—the first systematic view of hallucinogenic drug use among white American adults—indicates that the drug has relatively little potential for being compulsively or chronically abused over long periods of time. Dr. McGlothlin has suggested that the most

important reason why people typically decrease their use of LSD is to be found in the drug's characteristic subjective effects. "The major effect of the hallucinogens," he noted, "is to temporarily suspend the normal mode of perception and thinking. The utility of the experience lies in the uniqueness of the new modes of perception and thought which becomes available under these conditions. However, as one repeats the experience many times, what was initially unique becomes more commonplace and there is a process of diminishing returns. The effect of hallucinogens is indeed 'a trip' and trips tend to lose their appeal when repeated too often."

The pattern of use that emerged from the study is, of course, applicable only to the rather special population that was surveyed. Dr. McGlothlin observed, however, that there is a certain amount of evidence indicating that youthful drug users also tend to discontinue or sharply reduce their use of LSD and other hallucinogens over time. "This is not to discount the hazards of hallucinogen use by adolescents even for brief periods of time," he said, "but rather to predict that chronic patterns of use over periods of several years will generally *not* develop, for the same reasons as were operative in the older group described here."

Long-Term Effects on Subjective Parameters and Behavior

In this area of the study, the investigators separated the survey sample into two subsamples on the basis of the self-selection factor. One subsample was composed of respondents whose first use of LSD came about because their therapists suggested it, i.e., they were not self-selected in terms of motivation to take LSD. This was referred to as the TI group (therapist-initiated), and it contained 97 individuals. The 58 respondents who used LSD non-medically composed the other subsample, referred to as the NM group. The median number of LSD exposures was 3 for the TI group and 12 for the NM group; the median length of time between the last LSD exposure and the survey was, respectively, 9 years and 3 years.

The approach to the problem of determining whether LSD use had effected any durable changes in the TI and NM groups was to assemble two other groups with which to compare them—groups that matched the respondent groups in most important respects but had no experience with LSD or other strong hallucinogens. Thus, the controls for the TI group were also patients in psychotherapy with one of the three psychiatrists, but none had received LSD; as a group they matched the TI group on sex, age, education, and proportion hospitalized for psychiatric illness. A similarly matched control group of individuals who had never used

LSD was assembled for the NM group; it also contained the same proportion of individuals in medical and art-related professions. All the control subjects were interviewed and given the survey questionnaire, from which only the items relating to LSD use were omitted.

Subjective reports of change. The respondents were asked to evaluate how they perceived themselves at present compared to the year preceding their first LSD experience in terms of eight traits presumed to be influenced by the hallucinogenic experience (e.g., "more understanding of self and others," "less materialistic," "more appreciation of music"). The researchers found that the TI group did not differ from its control group in reporting any changes. The NM group, on the other hand, substantially exceeded its control group in reporting change on all eight traits—they saw themselves as more understanding of self and tolerant of others, less egocentric, materialistic, and aggressive, more appreciative of art and music. In addition, the TI group attributed changes to the LSD experience far less often than the NM group.

Nevertheless, two thirds of the TI group and three fourths of the NM group felt that their LSD experience had produced moderate to pronounced lasting effects. They said they had become more understanding and accepting of themselves and more tolerant of others because of the LSD experience. Their comments indicated that they had moved toward a humanistic, naturalistic, pantheistic philosophy of life in which the appreciation of nature's harmony played an important part. Many of the self-reported changes, Dr. McGlothlin noted, stemmed from LSD's acute subjective effects—that is, its capacity to dissolve the user's habitual structure of perception. People who attributed change to LSD experiences usually felt that this broadened perspective was ineradicable, and consequently had influenced various aspects of their lives.

Personality correlates. The survey questionnaire tested four personality attributes thought to be relevant to the hallucinogenic experience. These were hypnotic susceptibility; predilection for extremes, risk-taking and experiencing the unfamiliar; and preference for intuitive rather than factual approaches. Data analyses revealed that the TI group did not differ from its control on any of these measures, while the NM group scored significantly higher than its control group on all of them. This finding was in accord with the results of an earlier study made by the investigators in which they found that the people who scored high in hypnotic susceptibility and preferred to live casually and spontaneously tended to be attracted to hallucinogenic drugs and to respond intensely to their effects.

Beliefs and Values. One test measured the importance given to such factors as obtaining self-knowledge, overcoming egocentrism, approaching life with a passive philosophy. Another test probed the respondent's self-image, real and ideal, and a third measured his belief in paranormal phenomena such as UFOs and ESP. The results: The TI group did not differ from its control but the NM group scored significantly higher than its control on all measures but one (real self-image).

Attitudes. In this category, the TI subsample differed from its control group in that it held a more positive attitude toward Eastern philosophies. It did not differ on any of the other items (e.g., attitude toward individual freedom or foreign policy liberalism), or in its estimate of how divergent its attitudes were from those of parents or most other Americans. Interestingly, the TI group showed itself to be rather intolerant of the hippie subculture; many felt that hippies were to be blamed for the public's negative view of LSD. As for the NM group, compared to control, it showed significant differences on three items—Eastern philosophies, individual freedoms, and foreign policy liberalism.

Anomie and Alienation. No difference appeared among any of the groups with respect to a measure of anomie. With regard to alienation, the TI group showed significantly greater personal alienation than its control group, while the NM group showed significantly greater sociocultural alienation than its control.

Behavior variables. Only a few behavior differences were to be found between the TI and NM subsamples and their respective comparison groups. Specifically, the NM subsample was significantly more likely than control to show marital instability, to participate in Zen or Yoga training, and to accept non-orthodox religious concepts. The investigators had postulated that the oft-reported LSD-induced reduction in aggressive behavior might show itself in driving behavior. Accordingly, they collected information on speeding and other traffic violations from State records. The results, however, showed no differences among any of the groups.

The investigators concluded from these various analyses that, in the amount given to the TI sample, LSD does not produce a characteristic pattern of lasting changes in personality, attitudes, beliefs, values, or behavior in persons not self-selected in terms of motivation to take LSD. They pointed out that even though most of the TI group felt their LSD experience had resulted in lasting changes, the proportion of those reporting changes on specific variables was in fact no greater than the comparison group, nor was there any evidence of LSD-related change in the many items measured.

The NM group, by contrast, did show consistently significant differences compared to its control. One explanation for the very different showings made by the TI and NM groups would be that the LSD experience does not produce durable change at all; rather, it attracts a certain kind of person. However tempting it may seem, the investigators pointed out that to accept this explanation would be going beyond the data. It might also be argued, they noted, "that LSD-induced change is a result of the interaction of the drug effect and certain motivation and personality factors, i.e., that the necessary motivation and other conditions for LSD-related change existed for the NM group, but not for the unselected TI sample." In this study, as in previous work, the investigators found that people who are both attracted and responsive to the LSD experience are of a certain type: they like a casual, intuitive, and spontaneous style of life, they enjoy taking risks and exploring the unfamiliar. They are, in short, people who welcome the structure-loosening effects of LSD and other hallucinogens—and consider them to be highly useful—because such effects reinforce their natural inclinations. Nevertheless, the researchers concluded that accepting this interpretation also would go beyond their data: "While it seems logical that repeated hallucinogen use might facilitate lasting change in persons already predisposed, we cannot demonstrate this from the results of the present study."

Adverse Psychological Effects

Information was gathered about the incidence and nature of the following types of adverse effects, which are those most frequently attributed to LSD use.

"Flashbacks." One of the interview questions asked: Subsequent to your LSD use, have you experienced any uncontrolled LSD-like experiences without using drugs? Thirty-six of the 247 respondents answered yes, then described the instances in detail. Most were found to be relatively minor and not unpleasant or frightening. In only eight cases were there reports of major perceptual changes—e.g., seeing ordinary objects as weird animals—or depersonalization experiences, such as feeling that the mind had left the body. Moreover, the investigators could find no good evidence suggesting a causal link between LSD use and the occurrence of the events described as flashbacks. In the large majority of cases, they noted, "there seems to be nothing more than the association of two events bearing certain similarities."

Respondents who had used LSD more than ten times were more likely to describe flashback experiences than those who took the drug less often, and there were slightly more non-medical than

medical-only users in the group. Compared to respondents who reported never having a flashback, the flashback group had a significantly higher mean score on the hypnotic susceptibility test.

In reviewing their findings in this area, the researchers commented that their data highlighted the difficulty of defining the flashback phenomenon. "The term has been used dramatically in the popular media, and rather loosely in the psychiatric literature, to describe almost any experience which the drug user likens to an hallucinogenic effect," they wrote. "Frequent reports of flashbacks among young drug users may be related to their relative instability and a tendency to use the hallucinogens frequently in high doses. It is also relevant that these individuals are exceptionally suggestible, prone to believe in all kinds of magical and fanciful phenomena, value perceptual changes and seek to induce them by various methods in addition to drugs. In general, the concept of the flashback needs to be better defined before it is useful for describing hallucinogen-related behavior."

General harmful effects. Ten percent of the respondents answered yes to the question: Would you say your use of LSD has harmed you in any way? There were no important differences among the various subsamples of the population in this regard. The largest single proportion of those who felt they had been harmed cited a general loss of structure, self-discipline, and direction—although they were often ambivalent about this. The remark of one person was representative: "I've lost some of my goals. I don't know if this is harm—my boss would say so."

Psychosis. One case of a psychotic reaction lasting more than 48 hours occurred in the population sample. One other respondent blamed LSD for a "nervous breakdown" which lasted two years (no hospitalization), beginning four years after the last of 12 medical exposures to the drug. "Bad trips" were reported by 24 percent of the sample; half retrospectively viewed them as beneficial.

Suicide. There were seven known suicides and all had been patients receiving LSD in psychotherapy. None of the suicides took place during treatment and six of the seven patients killed themselves two years or longer after the last administration of LSD. The investigators were not able to find any information about the expected suicide rate among psychotherapy patients with which they could compare their data.

LSD AND PREGNANCY

The investigators followed up the outcome of the 148 pregnancies occurring in the population sample during the period of time

between first use of LSD and the survey. The number included all pregnancies, excluding only those that were ended by induced abortion.

For 121 of the pregnancies, one or both parents had taken LSD under medical supervision only. Exposure was minimal for close to half of these cases, involving one drug session by one parent. Twenty-six percent of this group had five or more LSD sessions and 16 percent had ten or more. Fewer than 10 percent had used hallucinogens other than LSD before conception. The parents of the remaining 27 pregnancies had used LSD non-medically; the total number of exposures for this group ranged from 2 to 165, with a median of 25. A majority of these respondents had also experimented with other strong hallucinogens before conception.

Findings in two areas were noteworthy:

Congenital defects. Fourteen babies were born with congenital defects, all of them to parents who had used LSD only under medical supervision. In half of the cases, the infant's defect was either familial or was caused by a known genetic disorder. The remaining cases were either relatively minor anomalies or were familiar complications attending prematurity. (The prematurity rate for the total pregnancy sample was within the normal range.) One infant died with pulmonary edema. On the whole, these findings provided no evidence that, in the amounts used by the subjects of this study, LSD use prior to conception increases the risk of having a congenitally defective child.

Spontaneous abortions. The spontaneous abortion rate for the medical-only LSD parents was 15 percent, which was similar to the normal rate. It was considerably higher for the non-medical users—34 percent if the woman who had five of the ten total abortions is included in the calculation, and 24 percent if she is excluded. (LSD was used frequently during these five pregnancies by both the woman and her spouse; she also had an abortion before she and her spouse began using LSD.)

Significantly more abortions occurred when the mother, or both parents, used LSD than when only the father had taken the drug. The researchers considered two possible explanations for this finding. First, the rapid production and turnover of germ cells in the male may rid him of any damaged sperm, while damaged female germ cells may remain until ovulation. The second possibility evolves from the fact that a greater proportion of the female LSD users were in psychotherapy than were the wives of male LSD users. While 36 percent of the 25 pregnancies ended in spontaneous abortion after the use of LSD in psychotherapy, only 14 percent of the 21 pregnancies aborted following LSD administration to a mother in an experimental setting. "Assuming that per-

sons in psychotherapy are under great emotional stress," the investigators reasoned, "and that such stress increases the possibility of abortion, this might be an alternate explanation for the higher abortion rate among mothers receiving LSD."

In sum, the findings on spontaneous abortions suggested that their incidence may increase among females who use LSD prior to conception.

MEASURES OF BRAIN FUNCTION AFTER HEAVY LSD USE

Sixteen respondents who had used LSD 20 or more times, and for whom there was no evidence of gross psychopathology before the first medical administration of the drug, were tested for abnormalities of brain functioning (organicity). The mean age of the group was 40 years; the median number of exposures was 75. Most of these individuals had tried other drugs, especially hallucinogens, and 6 had used an hallucinogen other than LSD at least 20 times. They were given a battery of standard tests designed to measure general intelligence and to evaluate visual perception skills and verbal and abstract abilities. For purposes of comparison, the same tests were given to a group of respondents matched on sex, age and education, and proportion receiving psychotherapy; no members of the comparison group had ever used LSD.

The test results were as follows:

General intelligence. There was no difference between the two groups.

Visual perception skills. The LSD group performed slightly more poorly than the comparison group on five of the six tests, but none of the differences was statistically significant.

Verbal and abstract abilities. The LSD group did a little better than the comparison group on verbal abilities. On two of the tests of abstract abilities, however, the LSD group performed more poorly, and on one of them (the category test of the Halstead battery) the difference was statistically significant.

The researchers evaluated their findings in conjunction with the results of two earlier studies made by other investigators (Blacker, K. H., Jones, R. T., Stone, G. C., and Pfefferbaum, D., *American Journal of Psychiatry*, 125: 341, 1968, and Cohen, S. and Edwards, A. E., "LSD and Organic Brain Impairment" *Drug Dependence* (NIMH), Issue No. 2, 1-4, December 1969). In agreement with the earlier work, Dr. McGlothlin and his associates found no generalized evidence of organicity in a group of heavy LSD users. One of the previous studies had found evidence suggesting that heavy LSD use impaired visual perception and spatial orientation. The UCLA investigators could find little substantia-

tion for this, although they noted that most of their LSD subjects—unlike those of the earlier study—had not used the drug during the year before testing. Thus, they suggested, the two sets of findings raise the possibility that such effect might persist for some time after LSD use, but are not permanent.

The strongest differentiation between the LSD and comparison groups which the UCLA scientists uncovered was in the area of abstract abilities; as noted above, the LSD group made significantly lower scores. In clinical studies of patients with suspected brain damage, a combination of low abstract-high verbal abilities is considered to be a warning sign of possible organicity. This combination was seen in the LSD group. For six individuals of the group, including the three heaviest users, the ratio of abstract to verbal scores was, by clinical standards, "moderately suspicious" of brain damage. This was also true for one person in the comparison group.

The investigators concluded that these findings were no more than suggestive, for it was possible that the between-group difference in abstract abilities stemmed from factors other than LSD use. Additional studies are needed to establish whether there are any causal links between heavy LSD use and impaired brain functioning.

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A Pre-School Program for Disadvantaged Children

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Introduction and Background

Carmen, David, Pablo, Maria, and the dozen other 3-year-olds playing in the courtyard of the Good Samaritan Center in San Antonio strike an observer as happy, energetic, and bright. And they are. However, were it not for a special educational program developed and tested by the Center, with financial support from NIMH, many of them would be destined at 6 to enter the public school system so poorly prepared as to be considered and treated as slow—a few of them, possibly, as retarded. Typically, their course through the school system would grow increasingly difficult, and a number would drop out early, prepared only for living at the low socioeconomic and cultural level into which they were born.

The Good Samaritan Center is a neighborhood center serving about 20,000 people on San Antonio's west side. This is a low-income area, more than 90 percent of whose residents are of Mexican descent. Though the neighborhood is clearly poor, it is not a slum. About 650 families live in two public housing projects; the others in small, one-story houses—some of them little better than shacks—covering block after block. Most of the houses, which would sell for perhaps \$6,000, are owned by the families living in them or by a relative. They are usually neat, but crowded; living rooms must often double as bedrooms.

In the four census tracts surrounding the Center, the median annual family income in 1960 ranged from \$2,830 to \$4,190. More than 60 percent of the families being served in the Good Samaritan's health and guidance clinics had monthly incomes of less than \$200 to support from 5 to 15 persons. Among the families of children now being served by the pre-school project, about a third

are on relief. Fathers are absent in about a fifth of the homes. The men typically are unskilled or semi-skilled workers; the women typically do not work outside the home.

Good Samaritan, located in the midst of the area it serves, is housed in half a dozen simply designed, one-story structures built around a courtyard. It is sponsored by the West Texas Diocese of the Episcopal Church and is supported by the church and by the United Fund of San Antonio and Bexar County.

Studying the problems common to the people of its neighborhood, the Center found them to be rooted in lack of education, which in turn was rooted in lack of preparation for school. Sixty percent of the children in first grade were considered problem children; 15 percent of all the children had been held back at least one year. Many of the teen-age dropouts could read and write English only haltingly; they could not express themselves adequately even in their first language, Spanish. Half of the adults in the neighborhood had not completed fifth grade.

Constance N. Swander, executive director of the Center, decided in 1964 that the long-run solution to the area's poverty and associated problems lay in preparing the children for success in school. She planned to do this through a pre-school program that would teach English while preserving and reinforcing the children's use of Spanish, and at the same time would develop the children's ability to learn by guiding them through planned learning experiences.

The program, which won NIMH support and opened in 1965, had those two principal objectives because Mrs. Swander recognized that the children had two principal handicaps—lack of an opportunity to learn English and also lack of the verbal stimulation necessary for a child to develop whatever intellectual capacity he was born with. In the typical disadvantaged home of San Antonio's west side, as in many disadvantaged homes elsewhere, children are likely to be ignored unless they misbehave, and language is used more for controlling their behavior than for telling them about objects in their environment or for otherwise instructing them. So they grow up lacking real facility even in their native language. And without language facility, points out Shari Nedler, until recently the project's psychologist, "the child cannot organize his concepts, he cannot reason at abstract levels, he cannot describe, analyze or synthesize; he cannot solve any but the simplest problems."

The 16 children who enter the program each year are chosen at random from the neighborhood's eligible 3-year-olds, who are

found by a house-to-house canvass. To be eligible, a child must come from a low-income,* Spanish-speaking family that has lived at least five years in the city and two years in the neighborhood. This residential requirement makes for a stable sample; in four years the project has lost only two children. Until the 1969-70 class of 3-year-olds was chosen, there was also a requirement that the child be able to speak only in Spanish. This requirement has been dropped, partly because most of the neighborhood's children do know a little English, picked up from television and from brothers and sisters who go to school, and partly because the Center wishes to emphasize that the program is potentially valuable for any culturally disadvantaged child, whatever the language he hears at home. When the eligible children—there were 54 of them out of the 130 3-year-olds found in the most recent canvass—have been identified, a table of random numbers is used to choose the 16 whom the program can accept.

During the first two years, the staff had some difficulty persuading families to let their children participate. Several families, indeed, flatly refused. Others had to be visited as many as half a dozen times by the Center's principal emissary, Gladys R. Blankenship, who is of Spanish descent herself and thoroughly bilingual. Mrs. Blankenship is superintendent of the school and co-director of the project with Mrs. Swander. The families knew and trusted the Good Samaritan Center; many of them just did not think a child of 3 was old enough to be parted from his mother, even if she did have—as she generally did—too many other children to pay him much attention. Today, mothers throughout the neighborhood are eager to have their children accepted in the program. And "Los Ninos," a weekly television show starring Mrs. Blankenship and several children from the Center, undertaken in 1969 at the request of Station KENS, is popular in San Antonio and neighboring communities.

In 1968, with the grant from NIMH due to expire in two years, the Office of Education made the project an arm of the Southwest Educational Development Laboratory, in Austin, Texas, one of the Office's 16 regional laboratories, and the laboratory named the project's psychologist, Mrs. Nedler, as its program director for early childhood education. Known now as the San Antonio Urban Educational Development Center, the project is serving as a model for other efforts with pre-school children from disadvantaged

*The Orshansky poverty index is used. A family is considered in the low-income group if, for example, it numbers seven persons and has an annual income of \$4,700 or less.

groups. As of early 1970, programs to further test the methods and curricula developed under the NIMH grant were going forward:

- in San Antonio with 400 Mexican-American children, a program conducted with Model City funding in the public schools;

- in McAllen, Texas, with 150 children of migrant Mexican-American farm workers;

- in Dallas, Texas, with 3-year-old Negro children in a recently established school for disadvantaged children;

- in Bossier City, Louisiana, with 50 Negro children.

Children from disadvantaged Negro families, Mrs. Nedler points out, have basically the same problems as those from disadvantaged Mexican-American families: they are not learning good English at home, and they are not getting the intellectual stimulation necessary for the development of language skills and cognitive abilities.

School sessions at the San Antonio center run for three hours each morning, five days a week. Each class of 16 has one young woman as teacher and another as assistant teacher. The teachers are college women who have majored in education or in child development and who speak Spanish fluently. The assistants are high school graduates from the same neighborhood as the children. Trained on the job, they serve not so much as aides—if this term connotes someone who helps with coats, serves snacks, carries messages—but as second teachers.

Building Confidence

Children in the Good Samaritan area, like children in other disadvantaged neighborhoods (and some children in more favored neighborhoods), typically receive little encouragement to begin a task and can have small hope of a reward for completing it. As long as a child is doing what he's supposed to do, his parents say little or nothing to him; they wouldn't think of praising him. But let him do what he is not supposed to do, and he is reprimanded. Such conditions stifle initiative and promote passivity. They may promote misbehavior as well, because misbehavior becomes one way of getting attention.

Through all its many activities, the school tries to develop a child's confidence and wholesome self-regard. At the very start, for example, each child is introduced to the class and given a name tag, which he wears proudly. Also, he is taken on a tour of the classroom and shown where things are kept, how to put them away, how to care for books, and how to carry a chair. Putting this information to use not only promotes good classroom discipline but also gives the child a feeling of accomplishment.

Classroom performance checklists, along with other observations, are used to assign the children to three smaller groups based on ability levels. Such grouping gives each child opportunities to experience success in work geared to his ability or readiness. The groupings vary for different activities and are adjusted throughout the year. The teacher leads one group and the assistant another; members of the third group engage in individual projects—painting, building, cutting out designs, and so on.

Another aid to building self-confidence and a feeling of identity is "tell time," a period right after roll-call during which a child may come before the class and say anything he wants to say. The children don't have to participate, but most of them usually do. They talk about their mother or father, or something that happened at home, or a cut finger—anything. Even the 3-year-olds are eager to express themselves.

Children are praised when they answer correctly. They are also praised for working hard and behaving appropriately. A child who is unusually shy or passive is given special attention.

Teaching English

In the beginning, the Center thought that the children would learn English much as they had learned Spanish, by being exposed to it. As they took part in nursery school activities, the teacher would talk to them in English, using Spanish to explain. They would repeat her English words and gradually begin to use them: they would "pick up" the new language. Tests at the end of the year, however, showed that while the children had made progress on other fronts, they had advanced hardly at all in their knowledge of English.

The school then began developing a program for teaching English systematically. Based on its first-year experience and on word lists used in the public schools, it drew up a 2,800-word vocabulary and organized it by topical units—words dealing with the body, with food, with clothing, with transportation, and so on. Vocabulary building, however, is not an end in itself. The school's aim is to develop a child's competence in his first language by expanding his basic fund of information through new labels, or words, and new concepts, or ideas, and then to introduce him to English by using the same labels and concepts.

During the first 15 weeks of school the 3-year-olds hear nothing but Spanish, for these children typically have a poor vocabulary even in their own language. As their teacher expresses it, they lack labels. Their mothers, unlike most middle-class mothers, have not been inclined to name things—and thus to teach the names—when talking to their children. They have been saying, "Get me

that," instead of "Get me the apple," and "Put it here," instead of "Put the apple on the table."

Lessons on body awareness, which is the first topical unit, begin with the use of a mirror to aid in self-identification, a pre-requisite of self-esteem. Many of the children have not used a mirror to any extent—some, not at all—and are not fully aware of their own features. The teacher asks, in Spanish, "Whom do you see?" Generally the child responds, "Me." So the teacher asks, "Well, what is your name?" Then she asks everyone to say, "Good morning, Juan."

After other members of the group have been similarly introduced, labeling begins. The teacher points to her nose, eyes, mouth and names them; then she has the children, one by one, say *nose*, *eyes*, *mouth*—in Spanish—and point to these parts on their own faces. Next the teacher touches a child's arm. "Este es el brazo," she says. "Este es el brazo, verdad?" Touching his ears, she says, "Y, estas son sus orejas—orejas, si." When she asks a child where his ears are, he may hesitate. At home, undoubtedly he has heard the word *orejas*, but he has not quite connected it with his own *orejas*. The teacher comes back to him every once in a while until it is clear that the connection has been made.

As part of the body awareness unit, the class makes a life-size puzzle. The teacher traces around a child; then asks, "What is missing—what does he need to be able to see? To be able to hear?" and so on. Once the missing features are put in, the teacher cuts the figure into parts, and each child gets the opportunity to put it together. He is encouraged to talk about what he is doing.

Games such as Simon Says are also part of the curriculum. As with every new activity, the teacher and the assistant teacher first demonstrate how the game is played. Then they lead groups in playing it. Eventually, as a means of building self-esteem, each child takes his turn at being the leader.

At the conclusion of a unit, a performance checklist is administered. In the case of body awareness, the teachers ask, "Can this child identify himself by name? Label parts of the body? Locate them on a doll and on himself? Describe simple functions?" Lagging children receive special attention.

From body awareness, the curriculum proceeds to clothing. The teacher introduces the unit by giving the rule for this class of objects: "If you can wear it, it's clothing." She then labels articles of clothing. "Who has a dress on?" she asks. "I have," several girls respond. Says the teacher: "How do we know the dress is clothing? Because we can wear it." After she has labeled several pieces of clothing, she points to a chair and asks, "Is this clothing?" "Why not?" "Can we wear it?"

The clothing lessons introduce the children to the concept of fasteners. "Can you find buttons on your dress?" asks the teacher. "What do you suppose would happen if you didn't have buttons on your dress?" "What other ways can you fasten clothing?"

Sometimes a child will point to a zipper and name it in English. "Yes," the teacher will say, "that's very good. That's the way it is in English—*zipper*. Now, do you know how we say it in Spanish?" They want to know, so she teaches them: *segadura*.

The children are also taught the labels of such things in the house as stove, sink, chair, and table. The 3-year-olds have a model kitchen where they look at and touch the objects they are labeling.

In many learning situations, action is required because it strengthens the learning process. Half a dozen 4-year-olds, for example, gather with their teacher in a screened-off corner of the classroom for an English lesson. "We are standing," the teacher says, and places each child on his feet. "We are standing," the teacher repeats. "We are standing," say the children. The teacher begins jumping up and down, and the group follows. "We are jumping," the teacher says. "We are jumping," say the children. "That's right," says the teacher. "We are jumping. Now say it again: 'We are jumping.'" "We are jumping," say the children. The teacher sits down, and the group follows. "We are sitting," she says. "We are sitting," the class repeats. "Good," says the teacher, "very good."

All age groups study the same topical units—food, clothing, house, and so on—but the older the children, the more deeply each subject is explored. In the case of fasteners, for instance, the 3-year-olds learn the labels for some types of them, and the 4-year-olds expand this vocabulary. The 5-year-olds are led to consider the purpose of fasteners. The teacher holds up a child's shirt and asks first David and then Maria to try it on. They can't get into it, though, because the front has been sewn up. "What can we do about this?" the teacher asks. "How can we make this shirt easier to put on?"

"Cut it," one child suggests.

"Tear it open," says another.

"Fine," the teacher says, and proceeds to rip the shirt down the front.

But now when the children try it on, it doesn't function as a shirt. Again the teacher asks for suggestions. "What can we do now? How can we make this shirt stay together?"

"A button," somebody ventures.

Somebody else says: "A zipper."

"Good," says the teacher. "Let's see what a button will do." She

sews one on. The group talks about what a button does and then generalizes to other kinds of fasteners.

Lessons are based on what the child already knows. When English lessons begin for the 3-year-olds in January, the introduction of words and concepts in English is preceded by a short review of the same words and concepts in his first language. For instance, starting a unit dealing with vehicles, teacher and children talk about *un carro*, *un aeroplano*, and *un bus*. Then the teacher announces that everyone will speak in English.

Teacher, holding up a picture of an automobile: "This is a car."

Children: car.

T: All right. Say it, "This is a car."

C: This is a car.

T: All right. This is a car. Good.

T, holding up a picture of an airplane: This is an airplane.

C: Airplane.

T: Good. Again—

C: This is an airplane.

T: All right, Martin, say "airplane."

Boy: Airplane.

At each age level the teacher listens to each child in the group as he tries to reproduce a new word.

Children, as teacher displays a picture of a bus: "This is a bus."

Teacher: A bus. Again—

C: This is a bus.

T: All right. Let's have Martin say it.

Boy: Bus.

T: Bus. Good. Now let's say the whole thing.

C: This is a bus.

T: Very good.

Then the teacher asks questions requiring a "yes" or "no" answer ("Is this a car?") and other questions testing whether or not the child has related the word to the picture ("All right, Martin, show me the airplane").

The next year, when the children are 4, the language lesson is entirely in English.

Teacher (displaying pictures of an airplane, a truck, and a ship): "These are vehicles."

Children: Vehicles. These are vehicles.

T: Good. Why are these vehicles?

Several children: Because they have motors.

T: Because they have motors and because we can ride in them.

T (showing airplane): Do you ride in this?

C: Yes.

T: Then it is a vehicle. Say it.

C: Then it is a vehicle.
 T (showing ship): Can you ride in this?
 C: Yes.
 T: Say it. Then it is a vehicle.
 C: Then it is a vehicle.
 T: Listen, if you can ride in it, it's a vehicle.
 T (with picture of a shirt): Can you ride in this?
 C: No.
 T: So?
 C: Not a vehicle.
 T: It's not a vehicle. That's very good.
 T: This vehicle is a truck.
 C: This vehicle is a truck.
 T: Good for you. This vehicle is a truck. Cynthia?
 Girl: This vehicle is a truck.
 T: Good.

The teacher varies the pace of presentation in order to keep the children involved. They must listen carefully if they are to answer correctly:

T: Is this a vehicle: Is this a ship?
 C: Yes.

T: Okay. I want Martin to show me a vehicle that is an airplane. . . . Very good. I want Cynthia to show me a vehicle that is a truck. . . . Good. I want Juanita to show me a vehicle that is a banana.

Girl: It's not a vehicle.

T: No, you're right and I couldn't fool you. That's very good. . . . I want Olga to show me the *vehicles*. . . . Very good. She pointed to all of them because they are all vehicles. But are they all ships?

C: No.

T: Are they all airplanes?

C: No.

T: Are they all trucks?

C: No.

T: What are they all? What can you call all these things?

C: Vehicles.

T: Vehicles. That's very good.

A year later, when the children are 5, they learn that *vehicles* includes still other types and even sub-types. After the group has discussed the function of a passenger train—it carries people places—the teacher shows them a freight train.

Teacher: What kind of train do we call this one?

Child: Where are the people?

T: There are no people on this train. What does this train take?

Children: Food, gasoline. . . .

T: Food, gasoline. What else could this train take?

Child: A refrigerator.

T: A refrigerator. You're right. This is a freight train. Say it . . . Say it, Gonzalo, what kind of train is this?

Boy: Freight train.

T: Say the whole sentence.

Boy: This is a freight train.

T: Very good.

The lessons on vehicles—and on the other units—provide opportunities for taking up language differences that present special problems. One of these problems has to do with differences in length; *largo* and *mas largo* in Spanish become, when translated literally, *long* and *more long* in English.

Teacher: This train is short. Say it.

Children: This train is short.

T (pointing to picture of a long train): Is *this* train short?

C: No.

T: This is not short. So what could we say about this train?

C: It is long.

T: It is long. Say it.

C: It is long.

T (pointing to picture of a longer train): *This* train is . . .

C: More long. Longer.

T: Longer. Say it, This train is longer.

C: This train is longer.

T (pointing to longest train): What can we say about *this* train?

C: *More* longer.

T: No, we're going to say this train is . . .

Child: Longest.

T: Good. Longest. This train is longest. Say it.

Language lessons for the 5-year-olds also include a review of prepositions (the children learn, for example, that in English an airplane is *on* the ground but *in* the sky) and a sequence of questions enabling the child to relate present, past, and future tenses (the airplane is in the sky; before that it was on the ground; when the airplane on the ground takes off, it will be in the sky).

Expanded Language Program

Complementing the language lessons in all three years is what the Center and the Southwest Educational Development Laboratory call "the expanded language program." This is so planned as to arouse the children's interest in talking about the topics they

have encountered in the language lesson, and about related topics. It gives them practice in the new words—and concepts and structures—and at the same time requires them to use their memories, reasoning powers, and imaginations. An English lesson dealing with fruits, for example, is followed by a discussion of these and other foods. The teacher gets the talk started by asking questions: What fruits do you peel before eating? Does an orange have more juice than a banana? What would happen if you squeezed a banana? Another expanded language activity involves the cooking of rice and corn, in order to find out—and talk about—how cooking affects their volume. Food also is used to help teach the concepts—and the labels—of hot and cold (oatmeal and cornflakes) and big and little (apples).

As part of this program, books pertaining to the unit being studied are placed in the classroom for the children's use, and at story time each day the teacher reads from one of them. If the lesson unit deals with houses, for example, the teacher reads a story about houses. Then the children are encouraged to talk about their own home, or a friend's home, or anything that the story has brought to mind. Five-year-olds may spend three or four periods on the same story. The first day they may just look at the pictures and talk about what may be happening. The second day, the teacher reads the story and asks the children to compare their predictions with what actually happened. The third day the children draw a picture—the scene or event they liked best—and the next day they talk about it to the group.

For the 3-year-olds, the expanded language program is in Spanish throughout the year; for the 4-year-olds, much of it is in English, but the story period remains in Spanish. For the 5-year-olds, practically everything is in English. Daily music and art periods also serve the language program.

Developing Perceptual Motor Abilities

Many disadvantaged children reach first grade deficient not only in language skills but also in perceptual skills, which are even more basic to intellectual growth. The Good Samaritan school seeks to develop these abilities through planned daily exercises.

Training in attentiveness and auditory skills begins during the first week of school, when the 3-year-olds learn a rule about listening—that when they hear the bell, which is used to signal a change in activities, they will stop what they are doing and listen. Each child rings the bell and repeats the rule. Another time the teacher demonstrates two bells having different tonal qualities; then the children close their eyes, the teacher rings one of the

bells, and the children tell her which one it is. In another exercise the teacher plays one of four instruments—bell, drum, triangle, or cymbals—and a child who has been blindfolded is asked to walk to *it*. Other lessons deal with sounds in the home—a door closing, dishes rattling, a window being opened, water running. Such exercises get the children accustomed to paying attention to the differences between sounds and to locating the source of a sound. Many of the children, from crowded, noisy homes, may have learned to tune out; now they are learning to tune in. Later on, more advanced auditory discrimination lessons will sharpen their ability to detect and recognize differences in the sounds of words.

The visual training program includes practice in discriminating among objects on the basis of size, color, shape, or function; paying attention to the boundaries of objects, as in cutting out or coloring a picture; and noticing and reproducing patterns, as with blocks, pegs, and beads. Thus, the program strengthens visual skills and reasoning ability and at the same time helps prepare the child for an important task that he will face when learning to read—distinguishing one letter from another. Under visual training, too, come many exercises to strengthen attentiveness and memory. In one, for example, the teacher displays three pictures, then asks the children to close their eyes as she turns one over. Can they remember which one is missing? When there are four pictures, can they remember? Five? Seven? Another exercise uses letters instead of pictures. Another calls on the children to reproduce from memory patterns they have been shown—simple ones, like circles and triangles, at first; later on, numbers and letters.

While the typical disadvantaged child is proficient in such gross motor activities as running, jumping, and climbing, he lags in the development of the fine motor skills needed for classroom success, particularly in writing. The Center's daily schedule, therefore, includes such activities as lacing shoes, tying ribbons, manipulating small building blocks, dropping buttons through a narrow opening, using a pair of scissors, tracing, coloring, and pasting.

Evaluating the Project

By the time the children have completed two years at the Center, most of them—whether at play in the courtyard or at work with another child on some project in the classroom—are using both Spanish and English. There is no conscious choice, the teachers think; the children use the words that come to mind first.

Will these children, after the third pre-school year, be able to compete in first grade with children who have learned English at home?

The staff feels that they will. In substantiation, the teacher of

the 5-year-olds points out that in first grade, where she taught for four years, teachers are supposed to begin the reading readiness program immediately, a very difficult matter with children who know little English. The 5-year-olds at the Center, she thinks, are ready for such a program even before they have finished half of their last year. They have been trained to listen, which is one of the goals of the public schools' reading readiness program. They have learned enough English to be able to follow instructions; for example, they know when the teacher is talking about the top of the page and when she is talking about the bottom. They have learned other concepts and the English words for them. Give some first-graders from disadvantaged homes two or three objects and ask whether they are the same or different, and the children will just look at the teacher or say, "Maybe." But the children at the Center, she says, "can tell you right off." The Center's children have also had experience in a common reading-readiness exercise: "Let's look at this picture and you tell me what you see." The Center's children have done this many times; they know the labels in English—"boy," "girl," "father," "mother," "house," "car"—for what the pictures show, and they have had practice in expressing themselves.

Approximately 30 of the Center's graduates are now in first or second grade, in half a dozen different schools. Two teachers have spoken highly of the few they have encountered, and at least a dozen mothers have dropped by the Center to report that the Good Samaritan graduates are doing considerably better in school than their older brothers and sisters.

For lack of funds, the Center notes, a systematic follow-up of these children has not yet been undertaken. However, under a program financed by the Southwest Educational Development Laboratory, an effort has been made to evaluate the San Antonio project on the basis of (a) changes in the children attending its classes during the 1968-69 school year, and (b) a comparison of these changes with those experienced by children in two other groups. One of these groups came from three day-care centers in San Antonio funded as Head Start programs under the Office of Economic Opportunity and concerned with children from Mexican-American families of low-economic status. These centers offered some of the elements of the Good Samaritan program but were concerned in the main with providing all-day care and supervised play. The second comparison group comprised 16, 3-year-olds who were eligible for the Good Samaritan's regular program but could not be admitted. The parents of these children were encouraged to participate in a parent-involvement program; through it, the Center hoped to learn whether or not the children could be

affected indirectly by increasing the parents' interest in child development. As it turned out, the fathers and mothers involved in this program attended the scheduled semi-monthly meetings quite irregularly, and the discussions—though they included such topics as hygiene, mental health, and story-telling techniques—were not so specifically concerned with child development as had been planned. Essentially, the children in this group may be considered controls—that is, as having experienced no significant intervention.

To try to determine the intellectual development of the children in the three groups during the nine months between September 1968 and May 1969, the staff used:

1. The Leiter International Performance Scale, a non-language test relying heavily on visual discrimination. Some items call for matching one object with another; others, for grouping objects that belong together. The examiner demonstrates what is to be done—for example, he takes a red block and puts it with a red square. Then he gives the child other items in the same category to do by himself.

2. The Peabody Picture Vocabulary Test, which provides an estimate of the child's verbal intelligence although the child himself is not required to talk. The examiner names an object (such as "dog") and then asks the child to point to it in one of several pictures presented to him. In addition to the standard English version of this test, the Center developed and used a Spanish version.

The results are shown in Table 1.

Table 1

AVERAGE SCORES BEFORE AND AFTER NINE MONTH TRIAL PERIOD						
Test	Good Samaritan		Day Care		"Controls"	
	Sept.	May	Sept.	May	Sept.	May
Leiter	107	121**	99	101	97	96
Peabody — English	59	68	60	63	58	58
Peabody — Spanish	88	102**	76	77	75	80

* Children in Parent-Involvement program. See text.

**Significant at less than the .01 level, meaning that the results would have occurred by chance less than 1 time in 100.

In the first examination, as expected, since all the children came from educationally deprived, non-English-speaking homes, all three groups scored well below the national average in a test—the

Peabody—requiring the use of English in its administration. Each group fell below the average by at least 40 points. Even in the Spanish version of this test, the groups scored from 12 to 25 points below standard. On the instrument not requiring language in its administration—the Leiter—all three groups fell within the normal range. This result, too, had been expected.

Nine months later, only the children who had attended the Good Samaritan Program showed marked gains. On the English version of the Peabody Test, this gain was not—by a slight margin—statistically significant; on the Spanish version and on the non-verbal test, it was. The scores on these tests were also significantly greater than those made by the other groups.

In sum, the Center's program for 3-year-olds significantly increased their intellectual performance as compared with what it had been and as compared with the performance of children in a traditional nursery school program and with that of children not involved in a program.

The staff emphasizes that these findings are for a single year only and for small samples. It points out, too, that the evaluation tests used so far are not ideal by any means. Though the Leiter eludes the language barrier, the test is time-consuming and those who administer it may unwittingly provide clues to answers unless specially trained. The experience at San Antonio suggests that the vocabulary of the Peabody Picture Vocabulary Test is too advanced for disadvantaged pre-school children and contains too few items at each age level for accurate measurement of differences between groups.

Improved evaluation measures. In conjunction with child development authorities in Texas universities and the public school system, the Southwest Educational Development Laboratory is developing and standardizing several tests intended to measure a pre-school child's proficiency in language more adequately than tests now available. One such effort is modeled on the Peabody but has a vocabulary drawn from the same list of words used in building the school's language lessons. The new tests, which have both English and Spanish versions, are to be made available nationally after they have been standardized. Tests to indicate a youngster's achievement after a given lesson or lesson unit are also being developed. As another means of evaluating the program, children in the San Antonio project will be followed for several years after they have entered the city's schools.

Working with Parents

The Center keeps in touch with parents through monthly meetings to which all fathers and mothers are invited and through

conferences with individuals when desirable. The meetings are quite informal, almost like family gatherings; mothers even bring their new babies to be admired. At one recent session, the talk got around to how children ought to behave when they got to public school. One mother expressed the opinion that the teacher was always right. "Keep quiet," she said she told her first-grader; "then the teacher is going to like you, and you'll pass into second grade." The other parents seemed to agree. Mrs. Blankenship suggested, though, that it was healthy for a child to ask questions, that he had a right to ask them, and that, in fact, a teacher would like him to ask them.

When a problem arises that the Center alone cannot meet, the people who know the child and his family—generally at least one teacher, her assistant, and Mrs. Blankenship—talk it over and decide how to advise the parents. Usually the mother will be asked to drop in; sometimes a staff member will visit the home. The mother of an extremely timid girl was advised to scold her less, praise her more, and give her some opportunity to talk. The parents of a boy who had no motivation because at home his older brothers and sisters did everything for him, were advised to let him have more responsibility and to praise him whenever he undertook a new task.

Parent Education Program. This program, a revision of the parental involvement project noted earlier, is for 16 mothers of 3-year-olds who are not included in the regular pre-school course. At the start, each mother was video-taped as she taught her child simple tasks, such as sorting blocks, and as she read to him. The staff wanted to learn how well the mothers explained a task to their children, how they organized information, to what extent they used praise, and how much affection there was between mother and child. Now the Center is trying to train the mothers to work with their children more effectively. This involves showing them how they can present educational activities, such as comparing fruits of different color and size and labeling and counting common household objects. In many cases it also involves changing certain behavior patterns, the most common of which is to ignore good behavior and punish bad behavior, so that the only way a child gets attention from his mother is to misbehave.

Mrs. Blankenship, working with mothers at the Center, demonstrates a different activity each week. Once a week another staff member visits the homes and observes how the mother works with her child and whether or not the child has learned the activity for the week. The Center plans to continue this program for three years so that it can compare the effects of working directly with children in the classroom and working indirectly with them

through their mothers. Evidence that the children of the mothers in the Parent Education Program are substantially benefitted would be welcome, would point toward a way of reaching educationally disadvantaged children at a cost considerably below that of establishing classroom programs.

Materials for National Use

Instruction manuals presenting the curriculum day by day for each of the three years have been prepared so that the San Antonio program can be readily adopted elsewhere, the Spanish-language sections being omitted where English is the children's native language.¹

A training program for teachers includes film strips on the Center's program and philosophy and a manual.

Research Grant: MH 14988

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References:

- A rationale for the bilingual early childhood program. Southwest Educational Development Corporation, Austin, Texas, 1969.
- "The Crucial Years" and "Bridging the Gap," filmstrips developed by Good Samaritan Center, San Antonio, and Southwest Educational Development Laboratory, Austin, Texas, 1969.

¹ Requests for curriculum and training materials should go to Mrs. Shari Nedler, Program Director, Early Childhood Education, Southwest Educational Development Laboratory, Austin, Texas.

Infant Stimulation As Part of Well Baby Care in a Disadvantaged Area

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"I have felt lonely, forgotten, or even left out, set apart from the rest of the world. I never wanted out. If anything I wanted in."

Arthur Jackson, age 15

The me nobody knows, children's voices from the ghetto

Increasingly it has been realized that helping a child "in" must begin very early. People involved with Head Start, a federally sponsored preschool program for disadvantaged children, came quickly to the realization that they were not beginning nearly early enough. Some suggested expanding the schools and preschool programs to even younger groups while others felt very strongly that the young child should be assisted while still in his home. One research program at Children's Hospital in Washington, D.C., has attempted to reach young mothers to help them learn ways of caring for their children and stimulating their intellectual growth so that they will be able to meet with success when they enter school. This program, working with black, unmarried, teenage mothers has shown that many can be helped to provide successfully both well baby care and the sort of interaction that helps a baby "learn to learn." Results show that babies who have had this combination of well baby care and infant stimulation have higher developmental I.Q.'s at 6 months of age than babies who have not had this program. This difference continues to show up and to become more pronounced when the babies are compared again at 1 year and 2 years of age.

Almost all of the mothers in the program had ambitions for their children to "go further" than they themselves had done. They wanted their children to be successful in school and do well for themselves in life. This project attempted to help them realize the important first steps in making these dreams come true for their babies. Although in many cases the mothers were quite immature and themselves locked in cycles of poverty and lack of education, most were cooperative and eager to participate in the program.

MOBILE COACH PROJECT

A total of 140 young women expecting their first child were found at city prenatal clinics. The girls selected were black, and between 15 and 19 years of age and lived in a specific area surrounding the hospital. They were in their seventh month of pregnancy, of normal intelligence, without chronic physical disease, and without gross emotional pathology. The group was then divided and one section received counseling from the research team and particularly from the public health nurse; the other, the control group, received prenatal and baby care given by city clinics and city health department nurses. The deliveries took place in city hospitals or in private hospitals under contract to the city. After the babies were born, a second screening was done, and only normal babies weighing at least 5 pounds 8 ounces remained in the study. This assured that the experimental and control babies had essentially the same characteristics.

Of the original 140, 95 pairs of mothers and children remained in the final study group. Twelve babies were born prematurely. A typical rate of prematurity for babies born to ghetto mothers is about 12 percent. There were other pregnancies that miscarried or resulted in stillborn babies. The odds are against these babies even in cases such as these where the mothers had obtained prenatal care. After delivery many mothers moved away and a few became uncooperative. Those who moved within a half hour's trip by car were retained. In Washington, this encompasses almost the entire city so that only those who moved to the suburbs or out of the city were lost for this reason. This left 47 mothers and children in the experimental group and 48 in the control group.

A mobile coach brought well baby care to the door for those in the experimental group. A public health nurse worked with each mother individually to teach her about her baby's development. The mothers were encouraged at each phase of development to respond to their babies particular needs and to supply a stimulating and protective environment. The mobile coach made possible a very active reaching out and facilitated well baby care. Those in

the control group were visited by the city R.N.'s. By and large, the city nurses only followed the babies for two or three months. However, if there were problems it was up to the mother to see that the child got to a well baby clinic for check-ups. All mothers in the program used Children's Hospital clinics and facilities in emergencies and at times of serious illness.

The orientation of the stimulation program was frankly middle-class and its major goal was success in school for each child. This was a practical test, as schools remain the main way in which children can learn the things they need to know to be successful in our society and to be able to get and hold good jobs. The methods taught the mothers were built upon the concept of protecting and expanding the child's curiosity and developing good verbal skills.

The original plan was to work with the mothers until the child reached 3 years of age and then to assist the families in placing their children in neighborhood Head Start Programs. However, Head Start programs have not been extended to 3-year-olds in this neighborhood and therefore only a few of the children have been placed in preschools. Some success in this area has been achieved, however, as one child is attending a Montessori school and four have been considered eligible for scholarships to a good private school in the city. However, it is almost impossible for these mothers to provide transportation and to pay even incidental expenses for private preschool education. The loss of the planned Head Start programs is serious, as it has been demonstrated that it is necessary to keep up a level of stimulation if a child is going to continue to progress and not fall behind.

The Mothers

All of the mothers were between 15 and 19 years of age, unmarried, and pregnant for their first time. They all lived in a 15-census tract area around Children's Hospital. This area is basically a low-income, black ghetto. It is an area of old rowhouses, old and crowded apartment buildings, a high-crime rate, and many social problems. It was an area highly involved in the riot in 1968. All of the girls had normal intelligence, between 70 and 115 on the Peabody Picture Vocabulary Test, and were without evidence of chronic physical disease or major mental pathology as determined by a short interview with the psychiatrist. They were all willing and able to participate in the program. Almost 70 percent were born and raised in Washington. All of them had finished elementary school, and about 20 percent had finished high school. Most had received average grades in the regular academic curriculum and wished to finish school. Many wanted to take additional training and learn some skill or trade. Very few showed anxiety or

depression. About 90 percent were pleased about or at least accepting of the pregnancy. Almost half had known the father for one to three years and more than half expressed love and confidence in him. Most wanted to get married and have one to three more children. None saw adoption as a desirable course for their baby. Most had the assurance of help from the grandmother or other relatives.

The girls lived in crowded households. About a quarter of the girls lived with both parents, but for another half of the group their mother was the head of the house. Over half of both groups had significant contact with their father or another man who had helped to raise them. Sixty-eight percent had an adult male living in the household. Their families' income tended to be at the level for unskilled laborers. However, only three of the girls came from families then on public assistance. Although none of these girls came from the lowest economic level or from the most disorganized families, they were still definitely poor and lived in a marginal way. Although all of the families said they served meat daily, it was found that they lived at a crisis level of food expenditure, spending less than the Department of Agriculture 1962 guidelines for emergency minimum expense. Although a large number of families had life insurance, almost none had health insurance or savings. Most of the girls came from homes that were characterized by good housekeeping, although there were many basically substandard conditions, such as shared kitchens and deteriorated structures. The families, by and large, were struggling to do the best they could. In all of these respects, the mothers and their backgrounds were essentially the same in both the experimental and control groups.

A survey was done prior to the program to determine the child-rearing attitudes of these girls. This covered the entire group. Questions were asked to assess their attitudes about child rearing and to see what they understood of child development.

The first question dealt with the handling of aggression towards the parent. The girls were asked what they would do if at dusk they had to bring a child in from play who then became angry and kicked and hit them. It was found that even mild aggression towards the parents is not tolerated and is usually punished. About 60 percent of the mothers would respond punitively and about half were in favor of spanking in such a case. Some favored explaining why and then spanking.

Another question dealt with the use of punishment for immature behavior during toilet training and was concerned with the acceptance of slow development toward maturity. For a 2-year-old who had a lapse in toilet training most would scold or spank, with

scolding preferred. Only one girl would ignore such an incident, whereas most middle-class mothers would do so.

With regard to diet, most felt a rather active controlling role was required rather than a passive one. Almost all of the girls felt that they would coax or make a child eat vegetables rather than simply offering them and then ignoring it.

In the crucial area of verbal development, only 25 percent of the girls would encourage a child to talk when adults were sitting around visiting. Many would permit an answer if the child were spoken to, but a third would prefer the child to be absolutely quiet. Here the girls with the higher I.Q.'s gave significantly different and more positive answers than those with lower scores. This encouragement of speech and the acquisition of early and basic verbal skills, as well as having pleasant associations with speech, is extremely important in the development of communicative skills. The investigators noted here that initially the mothers were pleased with the sounds of their first child and responded naturally with cooing and other sounds. It was found that with help the mothers continued this healthy trend even though it became more difficult when their children became active physically and, in addition, began to bombard them with questions.

When asked what they would do if a child was misbehaving all day long—a question designed to tap the girl's perception of underlying causes of behavior—some girls would look for illness or another reason, such as boredom or unhappiness, while about 50 percent would scold or spank. Here the girls with the lower I.Q.'s gave more positive answers than the others leading perhaps to the idea that intuition is more important here than intelligence.

Three-fourths of the girls would use praise very sparingly. There was a tendency to inconsistency with regard to discipline among the girls.

The girls, by and large, began with basically warm and motherly attitudes towards children. Almost without exception they expressed and demonstrated love and devotion for their infants during the newborn period. One question with regard to what to do when a child was afraid of the dark elicited interesting answers. About 73 percent would leave a night light on, stay with the child, or make some other sympathetic gesture. Even girls who were generally harsh about discipline seemed to be understanding in this situation.

When asked as expectant mothers what they thought they could do in the first five years of the child's life to help him do well in school, many replied with answers such as "teaching a child obedience," "teaching him honesty," "name and address," "ABC's."

Only about a third said "read to him" or other such types of stimulation.

It must be remembered that both experimental and control groups took part in this study, and that the two had essentially the same attitudes and basically were the same in approach to their children.

Prenatal Nursing Activities

The public health nurse associated with the research visited the girls in the experimental group at home and discussed with them many topics. Among these were the issues of diet, their pregnancy, the development of the baby and other things of importance to the girls. Visits were made approximately every two weeks prior to the ninth month of gestation and then each week during the final month. The nurse, Mrs. Marion Brooks, is black as were the girls, and she felt that this helped her to reach them and be accepted by them. She felt that good rapport was developed with all of the girls that she visited, and that most were eager to learn and communicate with her. Her general approach was to be quite definite about methods of child rearing and very supportive of the mother's desire to do well with her baby. Her visits prior to the birth of the baby lasted about one-and-a-half hours each time.

Prior to their deliveries, the mothers were encouraged to prepare for the birth and to plan their care for the child. They were helped to collect bright, colorful pictures for the walls of the baby's room, and the nurse stressed to them the importance of visual, auditory, and tactile stimulation to the young baby.

Well Baby Care

After the birth of the baby, a comprehensive program of well baby care was begun which included the infant stimulation program. Well baby care was offered in a dramatic way by taking a mobile coach and a pediatric team directly to the home. One visit was made each month for the first six months and then less frequently until the child reached 3 years. Between each visit the nurse visited to carry on the infant education program. Although there were some technical problems with the use of the coach, parking, etc., it was considered successful, as it demonstrated to the mothers the concern that was felt that their babies receive regular attention. A rather large coach was used with two examining rooms and a toilet, and it was felt that perhaps a smaller coach would have been just as useful. The coach allowed the home examinations to go on in a professional setting and a clean environment and also assured that the staff had a pleasant setting. The use of the coach has now been discontinued as most of the children have now reached 2 years of age.

Medical well child supervision was planned and administered according to the guidelines of the American Academy of Pediatrics. The program of infant stimulation was developed after an examination of the literature and a study of Caldwell's inventory of Home Stimulation.

After the coach was discontinued a doctor and nurse made home visits via a car. The visits totaled 22 during the three-year period. The children in the comparison group were followed in the regular District of Columbia Health clinics, and it was up to the mothers to keep appointments and to see that the child received well baby care.

The research families were counseled at each visit of the doctor and nurse on feeding, hygiene, sleep habits and normal growth. Toilet training, feeding problems, temper tantrums, thumb sucking, discipline, and other developmental problems were anticipated and received attention prior to and during the period of their occurrence.

The infants were provided iron and vitamin medication in prophylactic doses from the newborn period through the first three years of life. The mothers were given the home phone numbers of the pediatrician, the nurse, and the director of the project, and were urged to call for advice whenever it was needed. The mothers called often in the early months of their child's life and more infrequently later. When a child was ill, the mother was directed to take him to Children's Hospital, although the project staff treated minor illnesses, such as colds, diphtheria, impetigo, etc.

Group meetings for mothers were held occasionally on Sunday afternoons with the project psychiatrist, nurse, director, and occasional guests to discuss problems in child rearing. It was observed that the interchange of ideas was reassuring to these young mothers and stimulated their interest in the development of their children. In addition to these sessions, social events were arranged. One such outing was to a flower show and another was a swimming party. In addition, there were parties held at each staff member's home. Some of these events took place for mothers only, and some included children. These were designed to provide concrete evidence of the research team's interest in the mothers as well as the babies.

Some of the mothers had a feeling of being singled out and they asked why they were selected while pregnant friends had not been invited to join the program. They were told that it had to do with the timing of their pregnancy, and that the research had to be with young women in the seventh month.

Infant Stimulation Program

After the babies were born, the mothers were visited by the

public health nurse and a carefully designed stimulation program was carried out. It was felt that the very best teaching of the young infant has to be done by the mother who presumably has the strongest relationship, and who can achieve that blend of intimacy, affection, and stimulation that is the key to a responsive baby who is actively able to learn. There is an assumption here that these mothers are less able to do these things than are middle-class mothers. There is also the assumption that these children will be disadvantaged when in school with middle-class children if they are not helped. There is concern on the part of the investigators that these mothers, often overwhelmed as they are, will not see the importance of the type of interaction that produces an open and curious child who is able to learn successfully. The stimulation program was particularly designed to help build the type of verbal-cognitive background that typically occurs in the middle-class home. It is thought that particularly the acquisition of verbal skills depends upon the type of relationships fostered in the early days of a child's life. Intelligence in this study is conceived of as being made up of many abilities, many attributes, and built on many experiences and supported by good physical health.

This program was designed to give the ghetto mother the maximum support and assistance. The public health nurse helped, but did not replace nor displace the mother in her role with her infant. Every effort was made to communicate the value that the research team placed upon her and her infant. Efforts were made to reduce the feeling that only perfunctory care would be available. Many of these girls had so diminished an expectation of assistance that they were slightly suspicious of the program and the quality of care that it offered. The survey on characteristics of the mothers and their attitudes showed a basically positive approach to their children, but one that reflects the pressures of their lives and also their own lack of positive experience in many learning situations. Although middle-class families do not always reflect the most sophisticated ideas about learning and development, they tend at least to have a better idea about these factors and to be more in a position to afford the type of toys and to provide the type of environment where a child can at least explore ways of learning. At this point in time the research personnel were content to try and achieve a little more of the middle-class attitudes towards child rearing.

Throughout the well baby program and specifically in the stimulation contacts, another message was given indirectly to the mothers. It was hoped that by reaching out to her and helping her care for her infant the importance of her task and the value of it would become more obvious to her and that her own early sense of being

glad about becoming a mother, and her desire to take good care of her child would be supported and to some degree protected.

In both the well baby and the stimulation programs, as the nurse visited, she observed the mother's behavior with her child and also introduced and discussed various issues. Records were kept via checklists for each visit in the first three years. If the mother was not home, the caretaker, often the grandmother, was seen.

An emphasis was placed on all forms of visual, auditory, tactile and motor stimulation. The encouragement of exploration, the use of praise, the understanding of normal developmental stages were all important. Avoidance of over-stimulation was discussed and protection of the baby from accidents without inhibiting his curiosity. An emphasis was placed on the alleviation of superstition and on assistance to the child in handling his own fears. Normal child development was discussed continuously.

An effort was made to see the mother on each visit, but since many of these mothers either went back to school or were forced to go to work, often the baby was in the care of a relative. When the caretakers were the grandmothers, they were, in general, less receptive to the program than were the mothers. They had already reared children and tended to fall back on ways they had found successful. Also, Mrs. Brooks found that some were quite superstitious, for instance, fearing to let a baby look into a mirror as they believed it caused trouble with teething. It was estimated that on the average a mother was at home with her baby until he was about 15 months of age. Four of the mothers remained with their babies until they were 3-years old. In many cases a good day care center would have given the baby more stimulating care and a better opportunity to have the type of experiences that would help him cope more successfully with school and have a better chance of breaking a cycle of poverty.

The First Year—Stimulation Program

Ten visits were made by the nurse. Each one lasted about 1 hour. The nurse gave the baby toys appropriate to his age. A mobile, a rattle, a small squeeze toy, and plastic cookies on a chain were given to the new baby. Later, at 3 months, a cradle gym, a terry cloth toy; and at 6 months, a cloth book. At 7 months, a plastic hammer and a plastic milk bottle with colorful objects inside were given. A stack toy was chosen for 9 months, and at 1 year, a more advanced cloth book. The nurse in each case explained why the toy was appropriate and, if necessary, showed the mother how to use it. The toys were provided rather than suggested as the investigators knew it was difficult for the mothers to

afford extras, and few had cars or time to travel to purchase them. This was consistent with the philosophy of the program to make as much available as easily as possible to the young mothers.

The visits varied depending upon the age of the child and the needs of the parents. For instance, at 2 months, the nurse might point out that the child can observe the mobile and takes pleasure in bright objects. She might point out that the baby will stop and listen to soft music or his mother's voice. The mother was told about verbal development. She was helped in observing how the baby begins to speak with throaty sounds and then progresses. The mother would be encouraged to respond to the baby and be told how important that was. Trips out of doors and to new places were encouraged. The development of tactile sense, important all throughout life, was explained. Cuddling, stroking, holding, and kissing were encouraged and the mothers were warned not to hamper a child's movements by more furniture or clothing than what was necessary.

As the need for discipline grew, the mothers were helped to use consistent and patient methods with an emphasis on praise and the understanding that a child's curiosity is valuable and not "bad" behavior. A frequent problem was that the mothers tended to confine or restrict their babies rather than safeguard the environment. The mothers were discouraged from slapping and from continually repeating "no" to their babies.

The Second Year

About 8-hour long visits were made and special emphasis was put on the mother's talking with her child and encouraging him to speak. The use of books and bedtime stories was stressed. The families were advised to help the child get large muscle exercise and to let him explore, jump, climb, and otherwise be active. Again, as in the well baby visits, the subject of accident prevention was raised.

The children were given more complicated toys, many of which stressed fine motor coordination, such as wooden beads to string or snap beads. Balls were suggested as a good toy for helping with gross motor development. The nurse also helped the mothers to develop homemade toys and to see that some household items make good playthings.

Although the nurse encouraged water play and mud pies, etc., generally the mothers were uncomfortable and felt such activities were too messy. Generally, the mothers did not want their children to get dirty or to put things the mothers considered dirty in their mouths. The nurse interpreted the need for the child to be free

from unnecessary concern about tidiness in order to explore textures and to play in an imaginative and creative way.

The Third Year

Here, there was an increasing emphasis on trips outside the home, on visual motor coordination, and language development. The use of pencils and crayons was encouraged. Discussions with the caretaker or mother emphasized the need to satisfy the child's curiosity, to praise, and reward him frequently, and to admire his achievements. The mothers were encouraged to answer the interminable questions asked and were helped to see that questioning was important to the child and the basis for later intellectual growth. The mothers were told to be honest with their children and to admit it when they didn't know the answers. Consistency in discipline was again stressed.

The nurse visited about six times during the third year and each visit lasted about one-and-one-half hours. Dental hygiene was promoted as in the overall well baby program, and a toothbrush was given the child if he didn't already have one. A small blackboard and chalk and eraser were given at 28 months and a small hard-back book at 32 months. A puzzle was given as a farewell present at 3 years.

What Happened to the Mothers

Of the 47 mothers in the experimental group, 17 have married. Out of these 17, five have already had separations occur. In the remaining intact marriages, most of the husbands work at semi-skilled jobs, such as harbering, electrical work, etc. It must be remembered that many of the mothers were still dependent upon their families' support and that those who worked generally had low-level jobs. Six of the mothers are receiving public assistance. In one case, the money goes to a grandmother who is caring for the child. Of the experimental mothers, 11 finished high school before delivery and 9 finished after the birth of their child. Twenty-one of the mothers remain ungraduated. Four of these took some further training after delivery and four are still in school. All were encouraged by the research personnel to finish high school.

Nineteen of the 47 experimental mothers have had other children. Fourteen of these had one more child and five had two more. All of these mothers have been given access to birth-control information and devices as part of their maternity care provided by the city. Of the mothers who have had other children, 10 have obtained consistent well baby care for their additional children.

About one-fourth of the research mothers received both more than \$50 a month and fairly frequent visits from the alleged father. Another one-fourth had visits but not money, and the rest either sent small amounts of money and didn't visit or else ignored the entire situation. Not all of the mothers who married wed the father of their first child.

Most of the mothers had enough help from friends or relatives to leave the baby occasionally. A very few were terribly confined. The degree to which they left their babies seemed to depend upon the wishes of the girls. Some were more socially active and felt more hindered by the baby than others. Most were seen to be caring well for their babies and demonstrated love and affection.

Observations of the mothers and babies were made by a psychologist during the physical examinations at 6 months of age. The observer was unaware of the groupings. Results showed that the mothers who had participated in the infant stimulation program were markedly more verbal with their babies than the control mothers. This has not been completely tested out, but appears to be the case as the children grow older.

Most of the mothers seen by the research team were positive about the program and made contacts continually for information, in addition to regular appointments. For the most part, they were receptive to the ideas suggested and eager to learn. By and large, they were able to communicate well with the research personnel.

Early Results—The Babies at 6 Months

Although all the babies started out well at the newborn stage and both groups were comparable, there were differences in the Bayley test in developmental I.Q.'s at 6 months, and at 1 year, and even more pronounced differences at 2 years of age when the experimental children had significantly higher scores than did the controls. In addition, there was significantly less anemia in the experimental group. This was undoubtedly due to the provision of iron and the attention given to the diet of the children during the "out reach" well baby care. The experimental children, it was found, had also received more meat and had been taken out of doors more often than the control children. Both practices had been encouraged in well baby checks and by the public health nurse in her stimulation visits. Babies can develop anemia very easily if kept on a basically milk diet since milk has little iron. Their bodies need this substance for growth and development, and unless supplemental iron is given or large amounts of iron rich foods are added, anemia often develops.

At 6 months, there were only four children in the experimental group with hemoglobin levels below 10.0 gms. per 100 ml. Levels

below 10.0 gms. are considered anemic, and this is considered one index of general health. There were 14 control children with levels below 10.0 gms. This was a significant difference. In addition, the experimental babies had less skin trouble—primarily diaper rash—than did the others. They had better appetites and less thumb sucking, too. Although it might be predicted that babies in the experimental group would have fewer illnesses, this did not turn out to be the case and patterns in this respect did not differ. Growth patterns were not significantly different in any way either.

The children were also studied intensively physically, anthropomorphically, and in terms of medical history. Again, in most respects, they began the same and continued to be about the same.

In terms of the mothers and their family situations, again many factors were studied, such as crowding, the number of people in the homes, incomes, illnesses, financial resources, diet, and education. The two groups were basically the same, all were overburdened.

More Recent Results

The Stanford-Binet test is used when the children reach 3 years of age, and to date a trend has emerged that again gives the experimental children the advantage. This is a statistically significant figure, but not all the children have reached this age. It appears to offer some evidence of the value of the research intervention.

Research at this Point

A number of questions are being examined now. A large number of variables have been recorded and a statistical analysis is being conducted with consultation from Arthur Kirsch, Ph.D., who is an Associate Professor of Statistics at George Washington University. To date most variables explored have either been unproductive or both groups have remained very similar, except in terms of the health and development of the infants. A close examination of success in school will be made as these children begin school. No attempt is being made to modify their school experience in any way. The relationship between the mothers and their children will be observed and to a certain extent the relationship of the mothers to subsequent children. It will be important if positive results are achieved to find what aspect of the program can be held responsible and to know which aspects really work.

One major problem in this area is the subtlety of the results that are being measured. All of these children, both control and experimental, have received well baby care, in fact, the D.C. health department R.N.'s who do this also have a certain amount of

infant stimulation education that they include in their routine contacts with new mothers. The difference then is one of degree. All the mothers live in crowded homes, all have low incomes, and so on. This similarity in samples, combined with the difficulty in finding sensitive evaluative instruments, means that differences may not be easily seen or documented, even if they exist. There is considerable conviction on the part of the staff that differences exist. Some differences, they feel, are related to the relationship between the mothers and the staff and the enhancement of the mother's self esteem due to her participation in the program. There is a growing awareness that the large social problems that weigh down these families need large and powerful answers to go along with the improvement of infant care in order for differences to be seen. One idea behind working with the mothers, rather than the staff working directly with the child, is to give benefit to subsequent children as well as the child in this research program. Here, again, tremendous pressures make themselves felt. Mothers who participated well and followed directions, who seemed to understand the value of well baby care and took advantage of it when offered by the mobile clinic team still do not always take subsequent children to well baby clinics in a consistent manner. There is also some concern that, despite pressing social problems, and the availability of birth-control information, these young women seem to be on their way to large families. However, it is possible that many want two or three children relatively close together and that having achieved this, they will then exercise an option to limit their families. It is perhaps too early to tell if the idea of birth control has been successfully communicated.

Conclusions

- Early results indicate that young children can be helped to an adequate level of verbal ability through work done with their mothers.
- Relatively uneducated mothers can be assisted to provide a stimulating environment for their children even in overcrowded ghetto homes.
- It is important to work with the mother who is a key figure for the baby, and she may be able to use the same training with subsequent children.
- Well baby care will be better utilized if taken directly to the home.
- Infant anemia can be wiped out.
- There is a dire lack of preschool facilities.
- There is a desperate need for good day care centers for infants.

- A nurse who has been given only a small amount of special orientation can be effective in an infant stimulation program.

- Infant stimulation programs should be incorporated into well baby care.

- Infant stimulation programs and good well baby care alone may not alter the future of a baby born to a young, poor, black mother living in a poverty area.

This program is in a sense a minimal one—relatively inexpensive, using limited personnel, and the extensive use of a nurse to provide services. It is not a radical departure from the care generally believed to be desirable now. The teaching of the mother makes possible the continuation of the spirit of the program and hopefully will benefit the entire family. It appears that marked changes can be achieved in children through this type of stimulation, and that this is a fruitful approach.

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Mental Illness and Competency To Stand Trial

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"We were impressed that these men had incurred society's strongest sanctions against both the mentally ill and the criminal and had been provided with the safeguards of neither."

**A. Louis McGarry, M.D.
"Public Consultation in Medicolegal Matters"**

Three issues are involved in determining a defendant's competency to stand trial. The individual must understand the nature and the object of the proceedings against him. He must have the ability to comprehend his own position with regard to those proceedings. Finally, he must be able to participate on his own behalf and to communicate with his attorneys as they develop his defense. These are all legal issues. However, because of the complexity of deciding the mental state of another human being, judges typically have involved doctors, particularly psychiatrists, in the decision. The judge has discretion, where it seems indicated, to

request an outpatient evaluation or to refer persons to mental health facilities to obtain a psychiatric opinion relevant to whether or not they are competent to stand trial. This procedure means commitment for a matter of weeks prior to a decision as to whether or not a person can stand trial. If the person is "incompetent," then often the commitment becomes indefinite and he waits endlessly to be declared "competent." Although the judge makes the decision, the medical diagnosis of the patient—rather than an evaluation of the legal criteria of competency—often is the basis of the decision. Legally, for instance, many psychotic individuals can be competent to stand trial. Too often, however, a medical decision becomes a legal one.

At first glance it looks as though a rather enlightened and humane thing has occurred: the mentally ill person is treated with respect for his impairment and hospitalized rather than jailed. Actually the truth is quite different. A study by the investigator shows that the civil rights of these people have been seriously impaired in many cases and their psychiatric treatment has been compromised as well. Dr. McGarry and his associates came to the conclusion that *unless criminal charges can be otherwise disposed of, mentally ill defendants are far better served by an expeditious return for trial than by indefinite hospital commitment*. Many people spend far more time awaiting trial than the maximum sentence for the crime with which they are charged. Even if they are innocent, they never escape the stigma of hospitalization in an institution for the criminally insane.

The investigator has also concluded that a bias exists among psychiatrists against returning the mentally ill for trial and that this has led to unnecessary deprivations of freedom. It has been found that the concern of psychiatrists as to a patient's harsh treatment by the courts is to a great extent unjustified.

Dr. McGarry has been concerned with the issues involved in forensic psychiatry for a considerable length of time. He has conducted numerous studies and has served not only as an educator, but as a consultant on legislative matters concerning these issues. A number of major legislative advances have occurred recently in Massachusetts law as it affects the mentally ill offender, some arising out of the work reported on here.

Another major problem has been measuring the psychiatric condition of the defendant and communicating an assessment of his competency in useful language to the courts. Several instruments have been developed by Dr. McGarry and his coworkers that work towards solving this problem. The Legal Dimensions Psychiatric Protocol (LDPP) is potentially very valuable in delineating the types of ego deficits that impair a person's competency to

stand trial. Another instrument, the Court Room Apperception Test, based on the Thematic Apperception Test, is also being developed for use in articulating the competency issue in psychological terms. A third, the Competency Screening Test, is a sentence completion test which will offer information about the person's psychological state with regard to pertinent legal issues. All of these instruments work towards the goal of enabling professionals, other than psychiatrists, to share the increasing burden of assessing competency to stand trial, and towards improving the quality of psychiatric opinion on the issue.

A series of research studies have been undertaken that highlight some of the major issues in the field. These studies began at the Law-Medicine Institute of Boston University and have been continued at the Laboratory of Community Psychiatry at Harvard Medical School. The Institute was begun by Professor William Curran who is a lawyer and now the Glessner Professor of Law and Medicine at Harvard. Professor Curran had done a study in New Hampshire which convinced him that legal and psychiatric consultation in the area of competency left a great deal to be desired. He found that most psychiatric testimony was unsatisfactory from a legal point of view. In addition, a student of his, Donald Bright, carried out a research project at Bridgewater in 1960. He found that only two men in Bridgewater's history had ever been returned to trial after being indefinitely committed. This highlighted competency as an important issue which called for research and extensive reforms.

Several studies, under the direction of Dr. McGarry, were done at both Bridgewater and Boston State Hospital. Bridgewater, founded in the late 1800's, is part of the Massachusetts correctional system, and Boston State Hospital is under the Massachusetts Department of Mental Health. The interdisciplinary approach of the work presented here gave the research legal, psychiatric, and psychological respectability and enhanced the cooperation of both courts and hospitals.

A Study of Pretrial Commitments—Boston State Hospital

In 1964, a total of 1,437 men, women, and children were committed in Massachusetts to State hospitals for pretrial observations of their mental status. Records in Massachusetts show that the numbers so committed are rising rapidly every year. The Briggs Law enacted in 1924 in Massachusetts provides for routine psychiatric examination of all defendants in cases involving capital punishment, felony, or recidivism. Although this examination usually takes place in jail, it also contributes to the rate of referrals to State hospitals for evaluations. Massachusetts has a long

history of using psychiatric examinations in many types of cases. This situation is not limited to Massachusetts, however. One estimate from an NIMH study is that at any one time 15,000 persons are in U.S. mental hospitals under competency statutes.

At the point of pretrial examination, from a legal point of view, the court needs three types of information: the first having to do with competency to stand trial, the second with criminal responsibility, and the third with the question of commitment for further hospitalization.

Records of 107 patients sent for pretrial observations were studied. These covered patients charged mostly with misdemeanors and sent to Boston State Hospital in fiscal year 1960. One finding was very clear: that courts without psychiatric consultation had sent defendants for observation in a rather indiscriminating way. Where psychiatrists were advising the court, unnecessary observational commitments were often avoided.

The period of observation was usually 35 days and at this point a letter was sent to the court. The language of the reports was uniformly that of the M'Naghten Test,¹ i.e., "The patient is (or is not) now and was (or was not) mentally ill at the time of the alleged crime. He is (or is not) capable of distinguishing between right and wrong and does (or does not) understand the nature and quality of his act."

In addition to the M'Naghten Test references, a diagnosis was recorded and a brief description of the overt behavior during the hospitalization was provided. When patients were found to be psychotic, a recommendation to the court was added that they required "further hospitalization and treatment."

A pattern was found. Where the diagnosis was a psychosis the patient was declared to be in need of hospitalization, not criminally responsible for his alleged act, and inferentially incompetent to stand trial. The word "inferentially" is used because the question of competency was not directly answered leaving the inference that any psychotic person is automatically regarded as not competent. Uniformly those patients with nonpsychotic diagnoses were treated as not in need of hospitalization, criminally responsible, and inferentially competent to stand trial.

¹ The M'Naghten Test was established from the case of Daniel M'Naghten in 1843. It is the sole criterion of criminal responsibility in about 30 States.

. . . to establish a defense on the ground of insanity, it must be clearly proved that, at the time of the committing of the act, the party accused was laboring under such a defect of reason, from disease of the mind, as not to know the nature and quality of the act he was doing; or if he did know it, that he did not know he was doing what was wrong.

(McNaghten's case, 10 Clark and Fin. 200, 8 Eng. Rep 718 [1843] from *The Mentally Disabled and the Law*.)

Of the 107 patients studied, one escaped undiagnosed and 31 of the 106 were found to be psychotic. Of these, 27 were indefinitely committed by the courts to Boston State Hospital. In two cases the court required that individuals return to court; both were given probation and five years later had no further offenses. In two more cases the individuals escaped from the hospital. So in 27 of 29 possibilities, the judge accepted the medical judgment of the psychiatrist that further hospitalization was necessary—*thereby using a medical rather than a legal definition of competency to stand trial*. In 15 of the 27 committed, however, the statute used by the judge left the charges outstanding and rendered the individual still answerable for his alleged offense, when and if he is regarded as competent to stand trial in an indeterminate future. In 12 cases, patients were committed by civil commitment procedures with their charges not pressed, filed or dismissed.

For the psychiatrist it appears that the legal questions of criminal responsibility and competence for trial are subsumed under the medical diagnosis and follow the psychosis-nonpsychosis criterion.

In Massachusetts at the time of this early study, notice of criminal commitment and the right to a hearing were not required. As of July 1971, an act will take effect that revises this; a patient will be required to have a hearing as well as counsel. If a person is indigent, counsel—and if requested, independent psychiatric consultation—will be provided by the court. This is a major advance.

The outcome for indefinitely committed pretrial patients is a source of concern. Due to the necessity for the psychiatrist to decide if the patient is recovered enough to be considered competent and to so notify the court, the doctor is responsible for setting in motion court proceedings. In an overcrowded and understaffed hospital this responsibility may not be considered as one of prime importance, nor may the doctor truly understand that nothing will happen unless he takes action.

In Massachusetts changes have been taking place which concern the rights of the patient at the point of indefinite commitment. Paul Lipsitt describes in *Law-Medicine Notes* a recent decision of the Supreme Judicial Court of Massachusetts that has led to radical changes in the pretrial commitment procedures to mental hospitals of persons accused of crimes. In the case of Commonwealth V. Druken the defendant was initially tried and found guilty of breaking and entering as well as assault. He received a two-year sentence after the Bridgewater State Hospital had determined that he was competent to stand trial. On appeal the defendant was again sent to Bridgewater and was determined to be incompetent. As a result he would have been indefinitely committed until he was

competent. An appeal was made to the Supreme Judicial Court on the grounds that Druken had been improperly committed to a mental hospital. The high court held that a person who has been committed to a mental institution after a determination that he is incompetent for trial must receive the same safeguards against his loss of freedom that he would receive if he were involuntarily hospitalized on a civil commitment basis. This means currently that two physicians must certify that he is in need of hospitalization and the certifying physicians can hold no office or appointment in the institution to which the individual is committed. There is also provision in the newly passed statutes for periodic clinical review of the civilly committed which will now be extended to commitments under criminal status. These changes represent major reforms in Massachusetts.

Upon recovery, the criminally committed patient faces trial instead of freedom and a normal life. All issues involved in the trial become increasingly harder to assess as time passes. The criminal status of the patient in the hospital adds a subtle factor to his management and is generally thought to be an adverse one. In Massachusetts, at the time of this report, for instance, home visits and off-ground privileges were automatically denied. The court was still nominally responsible for the patient and the hospital more limited in many ways in its management of patient-defendants. Additionally, if the question of danger to the community was involved, the patient's right to a trial was again obscured on the basis of protection to society. It must be stressed that the patient *may not have committed the offense*. However, many patients were held on indefinite pretrial commitments for minor offenses such as vagrancy, violation of school laws, drunkenness, or "stubborn child" laws.

Obviously, where individuals have counsel to assist them, their own contribution to their defense can be weaker and where there is no active counsel the problem of competency demands a higher level of functioning. This double standard is alarming as here the presence or absence of active legal counsel has important implications—the man with money is more likely to have vigorous counsel. It is also entirely possible that a defendant could be "competent" with the assistance of one attorney and "incompetent" with another, less helpful lawyer. Dr. McGarry cites the example of an attorney who worked patiently and with great intuitive clinical skill to help a seriously depressed and suicidal man find a constructive and rehabilitative posture and to enable him to participate in his own defense. *In this early study at Boston State Hospital the active assistance of any counsel for these indigent defendants was rare.* Certainly active legal counsel should be required

even in cases of minor charges when the consequences are so severe due to the issue of mental incompetency.

A major fact stressed at the end of this study was that *delay in bringing the accused to trial can be constitutionally justified only on grounds that the individual is incompetent to stand trial whether or not he is committable or ultimately adjudged criminally responsible.* The rights of patients to a speedy trial had been seriously compromised in many of these cases.

The Bridgewater Study

In late 1963 the State Commissioners of Mental Health and Correction invited the Law-Medicine Institute of Boston University to become involved with work done at the Bridgewater Hospital. Bridgewater is more accurately known as the Massachusetts State Hospital for the Criminally Insane and is part of the correctional system. It is a maximum security institution and therefore usually only men charged with felonies are sent there. Hospitalization at Bridgewater is reserved for the mentally ill person who has "been a criminal or is of vicious tendency." It has been the center of publicity from time to time due to the notoriety of some of its patients such as Albert De Salvo, the self-confessed Boston Strangler and to the controversial film, "Titicut Follies," which was made there. Bridgewater serves about 760 patients.

In the project the Law-Medicine Institute staff examined all of the men indefinitely committed on the basis of incompetency to stand trial. At that time, December 1963, there were 219 men awaiting trial. Among these men were patients whose commitments dated back to the 1920's. Prior to 1960 only a handful of men committed in this status at Bridgewater had ever been returned to trial; in fact, more men in this status had left the hospital by dying than by all other avenues combined. The hospital staff resolved 15 cases before the Law-Medicine staff became active and this left 204 men who were all interviewed and their cases reviewed by the courts. The Institute in cooperation with the hospital staff was able to return 53 men to trial; 147 were still regarded as incompetent. Those who were in the hospital less than two years had a markedly higher rate of competency and return to courts. Many of the others were too impaired by lengthy institutionalization to be returned. Of the 53 who returned to court, 11 had charges dropped when the courts became aware of the long period of incarceration they had undergone at the hospital. Time spent at Bridgewater is legally considered time spent in prison.

The research provided the investigators with information that led them to believe that the remaining 147 patients declared incompetent, who had long-term hospitalizations, had been virtually

consigned to a life of incarceration and hopelessness with no resolution of their criminal charges as well as little of the active treatment that they might have had for their mental illness. It appeared that had a good many of them been assisted actively and returned for trial during the first two years of their hospitalization their lives would have been very different.

The Bridgewater staff, unlike the Boston State Hospital staff, did understand and make the distinction between competency and criminal responsibility and the medical diagnosis, but there appeared to be a bias against returning men to trial, particularly when the man was regarded as dangerous. In addition, there were serious staff limitations and observational work-ups received the priority attention. Once a patient was indefinitely committed, there was little staff time for active treatment. Therefore, the situation virtually became one where the patient was considered incompetent until he demonstrated his competency. The burden of proof was on the patient to present himself in such a way as to arrange to be returned to a trial. A man who tended to be silent and not particularly cooperative with the doctors was not likely to be returned to trial. It must be remembered that there are shadings in the common law test for competency that allow a range of opinion about when a man is able to return for trial. The investigators note that although a refusal to cooperate with the examining psychiatrist is within a person's rights, the psychiatrist might decide the patient would not cooperate with an attorney either. It has also been generally observed that psychiatrists demand a much higher level of functioning than that demanded by the appellate courts. Here again the lawyer can assist in "crystalizing" a defense from even a rather confused person. Incompetency findings, it was found, probably should be reserved for the most severe cases of deficiency, confusion, disorganization, or extreme withdrawal.

Dr. McGarry suggests that psychiatrists distrust the legal and correctional process and are overprotective towards their defendants. They view trial and possible imprisonment as punitive, stressful, anti-therapeutic and destructive, and mental hospitalization as supportive, therapeutic, protective and enlightened. He feels further that where the possible penalty is death or life imprisonment, many psychiatrists feel there is no purpose in putting a man and his family through the stress of trial when the outcome is likely to be so severe. Dr. McGarry also stresses that though some may exist he has never met a psychiatrist who supported the death penalty.

Further, the doctors have a stake in the future behavior of a mentally ill defendant as headlines about "former mental pa-

tients" committing serious acts are very disturbing and do not offer good public relations for the field. Fear of malpractice suits, adverse publicity, and criticism undoubtedly contribute to the cautious approach on the part of many doctors.

Another problem and a basic one is the incompatibility of the legal and medical professions. Any clever lawyer can make it very difficult for a doctor to testify in a secure and professional manner. There are numerous examples of doctors being challenged until they have made rash statements and then been discredited. The adversary system is not one that allows doctors their traditional approach, as lawyers are involved in this process with different goals. Medicine is the only one of the major professions where the competence of the practitioner is frequently attacked. It is unusual for an attorney to be subjected to cross-examination on his professional competence in open court, since malpractice actions against attorneys are rather rare. This is another reason for the physician to be reluctant to work in the courts. The entire process tends to work against the welfare of the client. It is easier to elicit pathology to prove a client incompetent than to show that the client is competent to stand trial in borderline cases. Where there is psychic pathology the presumption appears to be that of incompetency and the burden is to demonstrate competency.

In the Bridgewater study it was found that for many patients the length of their hospital stay far exceeded the maximum sentence they could have received had they been tried and convicted of the charge against them. Also the investigators found it psychologically important to many patients to have "their day in court," to tell their side of the story, and to resolve and work through society's dispute with them. In each case the need was perhaps slightly different, but a common need nevertheless.

A patient who is found competent, then stands trial and is either cleared or serves a sentence, is not necessarily then set loose in the community. He can be civilly committed. The process of civil commitment is one which generally provides considerably better safeguards for the patient and ultimately provides for more effective treatment of his mental illness in the sense that it is treated as a medical rather than a medicolegal problem. For example, a patient who is still under the authority of the court may not be extended privileges such as visits home, work programs and partial hospitalization, such as day or night programs which have been found helpful in the treatment of mental illness. It has been commented that perhaps judges feel the hospitals would be too quick to discharge mental patients who might pose a threat to the community, but this is a separate issue and is not at present a verifiable risk.

In order to study more fully the real consequences of the indefinite commitments and the risk to the community upon their release, a follow-up study was done on the Bridgewater group. A sample of 71 men who were returned to court for further criminal proceedings was drawn from the total population of 219 men indefinitely committed as incompetent and awaiting trial at Bridgewater on December 31, 1963. All 219 men were examined by the investigator and his colleagues from the Law-Medicine Institute of Boston University. The Bridgewater staff acted on 15 patients prior to the study. The 71 men were returned to court in 1964-1965. Of the 148 men found to be incompetent, the average length of hospitalization at the time of examination was 14 years and 9 months. Most of the men returned to court had been at Bridgewater less than two years. For the large measure they were charged with serious crimes. There were 23 alleged homicides, 11 assault and battery with a dangerous weapon or assault with intent to murder, 11 serious crimes (rape, incest, etc.) and 6 arsons. Only 12 were held for misdemeanors.

This study followed the men for five to six years. Data with respect to subsequent criminal activity was limited to Massachusetts jurisdictions, and there is the possibility that subsequent offenses were committed by these men in other jurisdictions, although it is unlikely that these were great in number.

All 71 were returned to court technically and 56 actually re-entered a court room as competent for trial in criminal proceedings. The remaining 15 had their charges dropped or were "nolle prosequi"—an entry on the record that the prosecutor or plaintiff will proceed no further in action or suit by the court. Not all of the 15 were necessarily competent to stand trial. It was found, however, that they had had charges dropped against them and that they could be hospitalized on a civil basis. In some cases, the patients had possibly been illegally kept by the hospital, as there were no charges outstanding although the courts had not informed either the individual or the hospital. *These men had been subjected to long-term hospitalization under criminal sanctions for charges that no longer existed.*

Of the 71 "returned" for trial, 24 were not prosecuted. They included 11 of the 12 alleged misdemeanants and 13 of the 59 alleged felons. Four who were not prosecuted had been accused of murder. The charges were disposed of by outright dismissal or "filing" by the courts and by "nolle prosequi" by the district attorneys. Some of these men continued to be hospitalized but under non-criminal status. Fourteen were found not guilty by reason of insanity, 12 of whom were accused of homicides. The findings of not guilty by reason of insanity requires a mandatory mental

hospital commitment in Massachusetts and almost all are then sent to Bridgewater. Several of these were subsequently released.

Most of those found guilty were either allowed to plead guilty to lesser crimes (manslaughter instead of first-degree murder, for example) or were found guilty of lesser crimes. Only 14 were sentenced to prison and 8 of these were subsequently released to the community, partly due to the fact that time served at Bridgewater awaiting trial counts towards the serving of a criminal sentence. No one was sentenced to life imprisonment.

The outcome was undoubtedly less severe for those who went to trial than for those indefinitely confined to Bridgewater awaiting trial. However, Dr. McGarry notes that the hypothesis that these men were best served by a return to trial was put to a severe test in view of the risk of heavy criminal sentences. One young man in particular was accused of a rape-murder to which he had allegedly confessed. In Massachusetts conviction of a rape-murder carries with it a mandatory death sentence. He acquired excellent counsel, however, and was only convicted of simple assault and battery. Since he had already served several years at Bridgewater awaiting trial, he was immediately set free.

Fifty of the sample of 71 reached the community during the follow-up period. Twenty-six of these had subsequent institutionalizations—either in mental hospitals or correctional institutions. Most of these institutionalizations were of a brief duration. Twenty-four remained free (one of these died during the follow-up period). Of the 50 returned to the community, 24 subsequently were accused of crimes. The crimes totaled 103 misdemeanors and 11 felonies. Twenty-one of the total of 114 crimes were classified as crimes against persons. Four men alone in this group accounted for 57 of the misdemeanors and 7 of the 21 crimes against persons. *A few of these men therefore can be seen as serious risks and dangerous to the community but most are of a relatively low-risk group.* In Massachusetts the recidivism rate for parolees from the State's felony prisons was found to be about 59.8 percent. The men set free in this study compare favorably, with a recidivism rate of 48 percent. It appears that the risk to society of released mentally ill felony offenders is no greater and is possibly less than comparable offender groups.

It is important that psychiatrists with responsibility for the care and treatment of offenders found incompetent to stand trial work actively to help the patient become competent. During the work at Bridgewater, individual and group therapy focused on the "teaching" of competency. Patients discussed cases, learned about courts and court personnel, had contacts with lawyers, were made aware of their rights, told about trial procedure, and so on. A high

level of motivation to return to trial was found among the patients. They recognized that without the first step back to trial they would never return to the community. Dr. McGarry feels that the therapeutic challenge here is not a complex one, since a relatively low level of functioning is required by the courts, and that supportive psychotherapy and education along with standard institutional therapeutic modalities would suffice in most cases. The most important issue is that the psychiatrist guard against a protectionist bias that prevents the patient from ever reaching the court room.

The investigators indicate that a patient who can be helped towards a remission with tranquilizers should be given this assistance. Furthermore, if the patient must return to jail to await trial, the importance of the medication must be stressed. There is little legal basis for the idea that the defendants must recover without the benefit of drugs or that they are not competent due to a need for drug therapy. The use of drugs could be an important part of an active program to return a defendant quickly to trial. This approach is in accord with the American Bar Association as enunciated in *The Mentally Disabled and the Law*.

Physicians need to be educated to be very active on behalf of their patients who are involved in the courts, take active steps to help patients get criminal charges disposed of, and aid in obtaining adequate and appropriate legal representation and judicial review of their cases. *The addition of legal staff to a hospital to aid patient-defendants in pursuing their due process rights and in negotiating with the criminal justice system in their behalf would be of immense benefit to this group.*

Criminal Vs. Civil Commitment of Psychotic Offenders

A seven-year study was made to explore the thesis that the criminal commitment status of alleged offenders awaiting trial is anti-therapeutic.

Out of a group of 107 patients who had been at Boston State Hospital for pretrial observation while charged with misdemeanors, further hospitalization was recommended by the doctors for 34. The hospital staff did not give the court an opinion as to whether this should be on a criminal or civil basis. The courts declined to commit 2 of the 34, but did begin commitment procedures for 32. The hospital and post-hospital records of these 32 patients were examined in this study.

The 8 courts involved chose to commit 16 of the 32 on a civil basis having dismissed or filed the criminal charges. Sixteen were committed on a criminal basis awaiting trial. The two groups originally had similar charges against them and had been hospital-

ized in the same hospital with the same staff in care of them. They were in most ways comparable groups.

Three patients were lost in the study group. One escaped, one was transferred and one was permitted to leave the hospital prior to the completion of the indefinite commitment proceedings. The study group then was 29, 15 (5 women and 10 men) with civil commitments and 14 with criminal (6 men, 8 women).

Of the 29 patients, there were 4 who were not psychotic and who were permitted to voluntarily admit themselves; they were regarded as having civil commitments in this study.

An examination of the two groups produced several findings. The seriousness of the previous criminal record did not appear to be a significant determinant of commitment status. Two of the civilly committed patients had previous felonies, two had previous crimes against persons as compared to one of the criminally committed persons with a previous felony and two with previous crimes against persons. The men committed in a criminal status all had previous misdemeanor charges, but so did eight of the ten men committed on a civil basis.

It appeared that the courts tended to use some discretion in choosing a criminal vs. a civil disposition. They tended to commit the very old, the very young, the alcoholic and the non-psychotic in a civil status. Men in their middle years with a large number of previous misdemeanor arrests, classifiable perhaps as public nuisances, tended to be hospitalized in a criminal status.

The men in the group who were criminally committed had long hospitalizations and only two of the six ever returned to the community. One of these two was an escapee. The average length of hospitalization during the seven-year follow-up was 61 months.

Of the men who were civilly committed, all ten were discharged. Hospitalizations averaged five to eight months. Two went to Veteran's Administration hospitals for further care and there had long hospitalizations of 56 months and 36 months—even the inclusion of these figures brings the average length of hospitalization for the civilly committed men to 14.2 months—a major difference from the 61-month average of the criminally committed group.

With the women the difference is blurred. All the women were subsequently discharged to the community. The average stay for the women committed in criminal status was 10 months and for the women civilly committed was 4.6 months. Although a difference exists it was not statistically significant.

For those who were discharged from the hospital a follow-up was done to determine the number of months they remained in the community and the criminal offenses, if any, they were accused of during this time. Only two of the criminally committed group

reached the community and both had further offenses. It is impossible to guess what the record would have been had the entire group been released. With the civilly committed group, there were very few subsequent arrests and only 2 of the 25 released committed crimes against persons. *This group was not one that had been characterized by serious criminal charges either before or after hospitalization.*

There is a serious concern within the courts as to whether relinquishing control over these persons and placing them under the jurisdiction of mental health professionals exposes the community to additional criminal activity. This work indicates that there is no additional hazard from civil commitments. In Massachusetts it was procedurally easier at the time of the early studies to commit a person in a criminal status than in a civil status. Neither a notice nor a judicial commitment hearing was required for a criminal status commitment. This has now been changed and constitutes another of the recent reforms in Massachusetts.

There is a point of decision concerning disposition that occurs at the time of arrest and again later in the criminal process. Police in Massachusetts can either jail a mentally ill person on a minor charge or apply for his admission to a mental hospital on a civil basis. At the time of arrest, courts rarely articulate these questions about disposition and competency, and they are therefore rarely provided with answers.

Doctors have participated in this warping of the legal procedure for a variety of reasons. In some cases it is due to legal naivete, in other cases a desire to shield the patient. Undoubtedly, too, there is a disinterest, in some cases, in what is fundamentally a legal rather than a medical situation. Tradition also plays a part. Dr. Thomas Szasz has recently accused psychiatrists of being jailors as well as judges. In his book, *Law, Liberty and Psychiatry*, he points out that moral values have often been redrawn as health issues and that psychiatry dealing as it does with behavioral manifestations, as well as affective states and thought processes, has been particularly vulnerable to this addition. He attacks doctors as having been all too willing to let patients suffer a loss of freedom without ensuring that all adequate and due safeguards for their rights have been available. Many doctors would simply say that this is not their responsibility.

Where the issue of community safety exists, the situation becomes complex. The welfare of the patient and the welfare of the community may ultimately be the same, but seem to part company at various points. The responsibility of psychiatrists for mental patients who might harm the community is traditional, but not well defined. Many people are classified as mentally ill only after

they commit a criminal offense. Mental illness has been sought as a convenient explanation for many criminal acts and also as a justification for more humane treatment of some criminals—which really only avoids the issue of how all prisoners should be treated. There has, too, been a general denial of one basic similarity between mental hospitalization and prison—loss of control over one's personal freedom.

Logically, the psychiatrist need not fully accept the aims of the court or its process in order to function effectively as its agent or as the agent of the patient in court. Actually, however, it seems that insofar as psychiatrists feel they must offer protection to the patient from what they perceive as a punitive criminal court, they may interfere with the process of justice for a patient.

It is because of the recognized need to find some workable, mutually acceptable questions and answers between physicians and courts that the Legal Dimensions Psychiatric Protocol was developed. It was designed to improve communication between the disciplines of psychiatry and the law in this area of mutual responsibility. To date, the psychiatrist tends to make his own judgments and to speak his own language, often in terms of global conclusive findings, whereas the courts tend to have their own standards and make assumptions about psychiatric decisions which may or may not be warranted. Confusion often results, as well as a lack of speaking to the exact issue involved, for instance, in deciding competency. The Legal Dimensions Psychiatric Protocol is designed to deliver psychiatric opinion to the courts in language, form, and substance sufficiently common to both disciplines to provide a basis for adequate and relevant communication. It standardizes, objectifies, and quantifies the relevant criteria for competency to stand trial.

The Legal Dimensions Psychiatric Protocol

This instrument consists of a scale on which 13 functions can be rated, all of which are related to the accused's ability to cope with the trial process in a self-protective fashion. It attempts to cover all possible grounds for a finding of incompetency. It is adjusted for each individual case. The purpose is to provide objective data which will be useful for the court.

It is not a predictive instrument, but is designed to reflect the competency status at the time of examination. Patients—particularly those recovering from psychosis—will vary from time to time in their scores.

The LDPP can be used by paraprofessional court personnel, such as probation officers, clerks of court, social workers, in addition to judges, lawyers, and doctors. It can be used as a screening

device as well as a more definitive summarizing evaluation. It can be used to separate patients who can be seen on an outpatient basis from those who need to be hospitalized, and by doing so can in some cases spare hospitals unnecessary and expensive evaluations and spare defendants the stigma of criminal mental hospitalization.

The instrument itself has a series of 13 functions about which the observer makes a judgment and checks a scale. The items were selected after a study of appellate cases, the legal literature, and the clinical and court room experience of the investigators. The total series is intended to cover all possible grounds for a finding of incompetency. The use of the findings will vary from defendant to defendant. For instance, it may be far more critical to the defense of a particular defendant that he be able to "testify relevantly" than for another defendant whose attorney does not intend to put him on the stand. The psychiatrist provides objective data—the evaluation and the implications are left for the court to decide.

This instrument may also indicate incompetency due to mental retardation; it is only designed to indicate disabilities arising from mental illness or mental retardation. Where doubt exists as to the origin of the incapacity—as, for example, from ideological or manipulative origins—the observer is instructed not to score the item. Where items are scored to indicate total or severe disability, the investigators note that these ratings should be substantiated by other diagnostic and clinical data; and the manner in which such a disability relates to the low degree of functioning in the particular item.

Defendants with mental disability of a severe degree, including psychosis and moderate mental retardation, frequently are competent in a legal sense and may achieve high scores. Mental disability is relevant to a competency determination only insofar as it is manifested by malfunction in one or more of the specific items of the instrument.

There is a basic assumption, too, that the accused will be adequately aided by counsel.

Items typical of those on the scale are: unmanageable behavior, understanding the various roles of people in the court, and the capacity to realistically challenge prosecution witnesses.

Mental Retardation and Competency to Stand Trial

The mentally ill are too often found incompetent to stand trial and the mentally retarded are probably not found incompetent often enough. Although not mentally ill, the retarded person may be unable to meet the requirements of competency due to his

limited ability to understand his situation. Often having learned to be agreeable and submissive in order to get along, the retarded person will routinely agree with the police or with his attorney, but this will be more a reflection of a behavioral pattern than a reflection of the true facts. In many cases the retarded person appears to act normally and the truth of his limitations is not recognized.

Recently, Dr. McGarry and his coworkers attempted to assist in the case of a man with a borderline IQ of 67 who had been accused of a misdemeanor and who was convinced by the police that he should confess. They hope that the case will be appealed and that the appellate court will set down more accurate guidelines for trying mentally retarded defendants. In this case, although the accused would and did cooperate with his lawyer, he was not able to sufficiently and adequately assist his lawyer, nor could he distinguish between the functions of the district attorney and those of his own attorney. They were in his view all "lawyers who want to help me."

Conclusions

Taken flatly, the facts remind one of the story, *Alice in Wonderland*. The patient must be able to cooperate with his attorney to be considered competent, but, of course, there may not even be an attorney effectively available. The patient might never have needed hospitalization, but now, accused of a crime, he finds himself hospitalized. He is innocent until proven guilty, but may be imprisoned for a major portion of his life before trial. Judges asking questions about competency receive answers about psychosis. The term that professionals working in this field continually use is "limbo."

Perhaps the key is demonstrated in this research with its interdisciplinary team approach, and the education of both disciplines, law, and psychiatry. Research and consultation by knowledgeable persons on the legal and procedural changes necessary, as exemplified by the work reported here, are needed. Research data can be very helpful when the emotional issues arise. For instance, the concern that the mentally ill person will do untold harm to the community must be answered; this research shows the concern to be largely unfounded. The tremendous distortions that can occur when the words mentally ill and criminal are linked must be acknowledged and realistically evaluated.

The institutions that house these patient-defendants must be made sensible to their real function and face the fact that they are serving also as prisons and not purely as mental hospitals. Doctors must answer the charges that social policy and practice have made

them jailors and judges and they must not be indifferent to these distortions of their therapeutic role. Where laws are too punitive or procedures unworkable, changes must be made. This can be done by activism from both the psychiatric and legal professions. For example, whereas previously in Massachusetts the superintendent of a hospital would have had to petition the court to make a change in the management of a court patient, now under the new reform act he will be able to notify the court that, for instance, the man will henceforth be in a work program, and unless the court objects within ten days the increased latitude is automatic. Not having to receive permission first will open up flexibility in patient-defendant treatment. The addition of legal staff to our large institutions would be an obvious protection to the patients just as the *active* and *informed* psychiatrist advising the court has been a constructive force in the administration of justice and in the lives of accused mentally disabled defendants.

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Studying Aspects Of Consciousness With the Physiological Feedback Technique

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The recent studies of Dr. Barbara Brown have demonstrated that man possesses the capacity to be more aware than he ordinarily is of his internal states, and that this capacity can be rapidly developed through the use of physiological feedback instrumentation.

The example provided by the investigator's studies concerned developing an individual's awareness of aspects of his consciousness. When subjects used self-generated cues about components of their EEGs, which were externalized in a display of colored lights, they learned to identify specific feeling states associated with specific brain-activity states in a single, hour-long practice session.

In a striking contribution to the field of biofeedback and consciousness exploration, Dr. Brown showed that there is a commonality of feelings associated with sustained alpha rhythms. Indeed, by an ingenious manipulation of color, she demonstrated that the association of alpha with a particular color may supplant the habitual feelings associated with that color. In one experiment half of her volunteers saw the color blue light up whenever they produced alpha, while half of her subjects saw a red light. Later these unwitting subjects were asked to sort cards (that bore words describing feelings) and to associate them with colors. Control subjects who had received no feedback whatsoever sorted the cards and associated feelings with the colors in a predictable and habitual way. But people who received red feedback during alpha no longer gave the habitual associations of aggressiveness and anger with the color red. Instead, they associated to red the same serene feelings that were associated to the color blue by those people who had received blue feedback during alpha. Both the experimental design which Dr. Brown used and certain character-

istics of the subjects' newly acquired skill indicated that the learning evoked in these studies was a function of insight, or awareness, rather than of conditioning.

The investigator also obtained data which provided clues about the nature of the learning process. It appeared to unfold in two stages, beginning at a pre-conscious level then proceeding to a conscious level of communicated awareness and voluntary control.

Background

The focus of this series of studies was the phenomenon of self-regulation that occurs in the physiological feedback study technique. The investigator was specifically interested in clarifying the part played by activities of consciousness in this phenomenon.

The Physiological Feedback Study Technique

Physiological feedback instrumentation is a system of electronic equipment that enables a subject to perceive, by means of an external indicator such as a light or tone, portions of some ongoing activity of his body, a physiological activity that ordinarily proceeds well below the threshold of his awareness. Secretion of gastric acids in the stomach would be one example, another would be the frequency oscillations of the brain's electrical activity. The system's components continuously perform a number of tasks in sequence: Detecting the activity, converting the information into electrical signals if necessary, filtering out the portion previously selected for feedback, amplifying the signals, and finally presenting the information to the subject in whom it originated. The sequence is carried out so speedily that there is very little time lag between detection and presentation. Thus, the system is co-producer with the subject of a scene in which physiological information is fed back to its source continuously and virtually instantaneously. System and subject together form what is called a closed biofeedback loop.

The Feedback Phenomenon

Operation of the system-subject loop has been shown to yield an extremely interesting phenomenon: With practice, the subject can learn to regulate the portion of his physiological functioning that the feedback devices allow him to perceive. To illustrate, when the feedback circuits are arranged so that a light flashes any time the subject's blood pressure rises above a certain point, he can rapidly learn to prevent the light from flashing, that is, to keep his blood pressure below that point. In other words, he can learn to control his blood pressure to some extent. The feedback phenomenon is

referred to generally as "self-regulation of internal states," and as the example suggests, it holds great promise as a therapeutic tool.

Clinical Uses of EEG Feedback

The work of Dr. Thomas Mulholland, at the Bedford, Massachusetts, Veterans Administration Hospital, indicates some of the diagnostic directions. Since 1961 Dr. Mulholland has been evolving a feedback system that may be useful in diagnosing perceptual damage and lapses in attention. In typical experiments, the experimental volunteers were wired to an electroencephalograph so that their brain waves would control the display of a light or projected image. The individual would relax in a soundproof chamber and soon he would begin to emit alpha waves (8-12 cycles per second), thus triggering a slide projector which would show a picture of an object such as a dog or policeman. However, as the interested volunteer would focus on the picture his alpha rhythm would vanish, turning off the slide. After a while, as he relaxed again and alpha reappeared, the slide would reappear. In a number of ingenious experiments Dr. Mulholland has analyzed eye movements and has found that when a person focuses visual attention his alpha vanishes. Thus, by setting a visual display and watching a person's EEG he can tell whether they are focusing visual attention on the display or not.

The disappearance of the alpha rhythm during visual attention has long been known, but the processes of focusing attention can only be seen clearly when the EEG has been stabilized by feedback. Then it is possible to see the difference between the person who is tracking an object visually, and a person who is aware of the blurred image but is not actually focusing on it.

An attention—or habituation curve—used by Dr. Mulholland has evolved from a technique of stabilizing the EEG by inducing a binary state. Ordinarily, a waking person's alternation between EEG alpha and non-alpha is idiosyncratic and disorganized. However, if he triggers a light every time he produces alpha, his alpha will subsequently vanish as he pays attention to the light (which also disappears) and eventually, through repetition, this creates a stable alternation between EEG alpha and non-alpha. At present, Dr. Mulholland is recording this binary periodicity from several locations on the head simultaneously, in order to describe differences between normal and brain-damaged veterans. A preliminary study indicates that there is a detectable difference between the alpha-non-alpha curves from undamaged loci and the locus of extensive brain damage. This system has detected damage that has not appeared on ordinary diagnostic EEGs. Further studies may offer a way of understanding aphasic veterans, who cannot speak

or communicate, a method for discovering what it is they pay attention to in the environment and what objects or events have meaning for them.

In the future it may be possible to use the stabilized EEGs to find out how long a child is paying close attention to an audiovisual educational display. Indeed, it may be better to judge the "attention grabbing" qualities of such an educational device by wiring a group of children to the EEG as they watched, so that the appearance of alpha might indicate their waning attention and eye fixation, instead of the usual approach of asking the children to say what interested them the most. At present, hyperactive and normal children are being compared for their EEG attention curves.

In further experiments, in collaboration with biological mathematicians, it may be possible to devise a model for the alternation of alpha and non-alpha under feedback—thus obtaining a glimpse at what may be happening within the organization of the brain itself, and gaining insight into the EEG signposts of the normal waxing and waning of a certain kind of visual attention.

The Exploration of Consciousness

In addition to its potential clinical applications, the self-regulating behavior that emerges from operation of the biofeedback loop is of extraordinary interest to research scientists because it involves learning in a domain that has traditionally been considered inaccessible to consciousness—the domain of physiological functioning ruled by the autonomic, or involuntary, nervous system. The key research question is, what is the nature of the learning involved in the feedback phenomenon? If it is learning of the automatic type, that is, if it occurs as the result of conditioning, then the feedback phenomenon would be compatible with the traditional model in which nervous system functioning is divided into involuntary (unconscious) and voluntary (conscious) spheres. If the learning involves insight, cognition, and awareness, however, that is, if it is a function of consciousness activities, then the traditional model would need to be radically amended to account for the feedback phenomenon.

This question had not been adequately explored before Dr. Brown undertook the studies to be reported here. As the investigator has pointed out, other researchers have used the biofeedback technique within an experimental framework of classical or operant conditioning. "Largely because of this," she observed, "the automatic features of the phenomenon have been emphasized and relations to conscious activity have not been generally explored."

In order to illuminate the role that consciousness or self-aware-

ness, plays in the phenomenon of self-regulation, Dr. Brown designed her experiments differently. In contrast to the approach used in previous studies, the experimenter deliberately refrained from introducing any external criteria of stimulus, response, or reinforcement into the bio-feedback loop. Instead, in her bio-feedback experiments, each subject interacted exclusively with aspects of his own psychophysiological functioning.

Approaching the Question

The physiological functioning that Dr. Brown selected for feedback was the electrical activity of brain. Specifically, the feedback circuits were arranged so that a subject would perceive information about three components of his electroencephalogram, or EEG (the paper record on which the brain's electrical potentials are traced). The components were the EEG frequency ranges designated as alpha (8-12 cycles per second), beta (13-26 cps), and theta (4-7 cps). Information about these components was fed back via colored lights.

The general procedure was as follows. A subject sat in a quiet, moderately lighted room, the electrodes for detecting brain activity pasted to his scalp. He was informed that differently colored lights could illuminate the display screen in front of him, and that the lights could be selectively activated by different portions of his brain activity, each portion of which could represent one or more feeling states. He was then invited to explore the situation and to try and identify, to himself, the feelings and/or thoughts that were associated with activation of one or another of the lights.

Three separate experiments were done. The first tested whether an individual *could* identify a more or less congruent set of subjective activities solely by means of an EEG component. When the data indicated the answer to be yes, a second experiment was undertaken to verify and extend the results. Lastly, because color was used as a variable, its influence on the subjects' feeling-brain activity associations had to be taken into account.

The conditions of each experiment are described below; a summary of the results of the series is given in the following section.

Experiment 1. Subjects were asked to try and isolate a feeling state that would keep a blue light turned on. Their practice sessions (ranging in number from one to four for the 47 subjects) lasted a little more than an hour and consisted of 10-minute experimental periods when the feedback circuit was in operation alternating with 3-minute rest periods when it was not operating. The subjects were informed of the beginning and end of each experimental and rest period, and told to keep their eyes open throughout. After sessions each subject wrote out his answers to these

questions: What did you experience? Describe any special technique you may have used to keep the light on? How did you experience time during the session?

The blue light was operated by brain activity in the alpha frequency range.

Dr. Brown organized the data collection and analyses so that she could determine whether alpha production increased with practice, and also whether there was a difference in alpha production during experimental as compared to rest periods. By instructing subjects to keep eyes open at all times the investigator was attempting to eliminate alpha increases that arise from certain visual conditions—e.g., alpha production usually increases if a person simply closes his eyes. Further, because less alpha occurs spontaneously in the eyes-open than the eyes-closed condition, this instruction also provided subjects with more opportunity to explore alpha generation in a conscious way.

It is important to note that the investigator programmed nothing into the experimental situation. All of its elements—the feeling state, the alpha-wave state, the searching operations that succeeded or failed in keeping the light on—were generated, tested, verified or rejected entirely in accordance with a subject's private, internal program.

Experiment 2. Subjects worked with three lights colored red, blue, and green. They were asked to try and identify, mentally, feeling states that would selectively activate the lights. They had one hour-long sessions in which to work at this task. Afterward, each wrote out descriptions of the feelings and/or thoughts he associated to each color.

For half of the 26 subjects the presence of beta activity turned on a red light, alpha operated a blue light, and theta a green light; the colors were switched for the other subjects so that beta was green, alpha was red, and theta was blue.

In this study the investigator sought to discover whether specific feeling states were associated with each of the three EEG frequency bands. She arranged the different pairings of colors and EEG components so that she could get some idea of the extent to which a subject may have associated feeling states to the colors as opposed to associating them to states of brain activity.

Again, as in Experiment 1, all programming that may have been required to carry out the task was the internal affair of each subject.

Experiment 3. Ninety subjects participated. Half were put through the same feedback procedure as that used in Experiment 2. Afterward, however, instead of writing down the feelings associated with the different colors, Experiment 3 feedback subjects

were asked to sort cards, printed with descriptions of feelings, according to the colors they associated with the feelings (*angry, impulsive, shaky, sluggish, at-ease, able-to-concentrate . . .* and so on, a total of 105 different descriptors), and to do so on the basis of the color-feeling associations they had made during the immediately preceding feedback experience. The color choices they were given for sorting the cards were red, blue, green, and white—the last represented no-color and was to be used to indicate no specific association between descriptor and color. The other 45 subjects were given no feedback experience; they were simply asked to sort the descriptor cards to the color choices on the basis of their habitual feeling-color associations.

In this experiment, Dr. Brown was primarily interested in gathering data that would enable her to differentiate the effect of color and the effect of the feedback experience on the feeling—(color/brain activity) associations which feedback subjects made.

RESULTS

Consciousness of EEG Components

The investigator found that the subjects did indeed learn to identify specific sets of subjective activities associated with specific components of their EEGs. The experimental findings that led to this conclusion are reviewed below.

In Experiment 1, abundance of alpha generation—expressed as the percent of time alpha was present during the total time of EEG recording—was the criterion for evaluating the subject's ability to sustain the feeling activity that would keep the blue light operating. Analysis of the EEG data showed that alpha production increased steadily in each succeeding experimental period in each of the four practice sessions. The average percent-alpha increased from 26 percent during the first experimental period of the first session to 53 percent during the last experimental period of the final session. Moreover, for each of the practice sessions the difference between averaged alpha-percents during the final experimental and final rest periods was found to be statistically significant, which suggested that practicing identification of an "alpha feeling" had resulted in the ability to discriminate the feeling. The investigator also found that all subjects could learn to increase their natural levels of alpha production but some were more adept than others, increasing their alpha by 50 percent or more as compared to those who attained maximum enhancement at a level 20–30 percent above their natural levels.

Three findings made in Experiments 2 and 3 further supported the conclusion that naive subjects can learn to become conscious of

different frequency ranges of their EEGs. First, the sorts of descriptor to color made by feedback subjects differed substantially from those made by the control subjects (who had no feedback and sorted only against color). Indeed, in numerous instances the feelings that had become associated with the colors during the hour-long feedback experience were found to have displaced habitual feeling-color associations as manifested in the sorts made by control subjects. Second, although the group of feedback subjects failed to agree about most feeling-color associations, they showed a large degree of agreement about feeling-EEG component associations, regardless of the colors used to represent the components. In consequence, the descriptors each independently sorted to the EEG components bore similar connotations; these sorts proved to be specific, however, as revealed by the assignment of markedly different connotations to each EEG component (see below). Third, the written descriptors of feeling-EEG component associations provided by the subjects of Experiment 2 were found to agree in content with the sorts of descriptor to EEG components made by the feedback subjects of Experiment 3.

Subjective Attributes of EEG Components

Dr. Brown found that the feedback subjects of the different experiments were consistent in the feelings they associated with the various EEG components. The written descriptors provided by the subjects of Experiments 1 and 2 agreed with one another as well as with the sort of descriptor cards that Experiment 3 subjects made.

The alpha mode was described as peaceful and pleasant, dream-like and mysterious, contemplative and conducive of transcendental thinking. Beta's mode was angry, irritated, frustrated, shaky, and investigative. The theta mode, the most elusive, was described as vasculating. Additional attributes of alpha were provided by Experiment 1 subjects. Their written comments suggested that those who were best at learning to enhance alpha gradually became aware only of the blue light during practice sessions, and felt themselves otherwise to have "dissolved into the environment"; they also tended to lose awareness of time during the sessions, or to feel that the elapsed time was much shorter than they ordinarily experienced it.

Dr. Brown commented that this commonality of feeling states-EEG component associations "suggests that perceptual and experiential data are organized similarly in the majority of individuals, and that similar chains of mechanisms process the data of both active perception and feeling states generated by prior life experiences."

The investigator also obtained some data about the relative facility of identifying the EEG components from the subjects of Experiment 2 who had sorted the descriptors to colors. They were best able to identify the alpha range, sorting the greatest single percent of all cards sorted to a color (alpha's was 23 percent) to that frequency range. They sorted the smallest number to theta, which suggested that it was the hardest to identify. (In terms of color, alpha appeared to be most readily "recognizable" when it was represented as a red light rather than a blue or green one. Similarly, when beta was represented by blue or green it received substantially more sorts than when it was red. The sort to theta appeared to be random.)

The Nature of the Learning Process

Data obtained in Experiment 1 indicated that many subjects learned to enhance alpha generation well before they were able to demonstrate discrimination in terms of showing a sizeable difference between the alpha productions of the final experimental and rest periods. This finding provided a clue about the nature of the process the subjects employed in forming associations between feelings and EEG components: It suggested that they knew the alpha feeling before they knew that they knew it. As Dr. Brown interpreted it, the subjects learned to identify an alpha feeling in a two-stage process—pre-conscious and volitional. In the pre-conscious stage of learning, she suggested, "a mobilization of biologic activity occurs which generates the appropriate signal (alpha) to operate the light successfully"; later, with additional practice, the pre-conscious associations emerge into conscious identification and voluntary control.

This interpretation gained additional support from certain results of Experiment 3. The card-sort technique used in that experiment enabled the investigator to identify three species of feeling-associations:

- 1) habitual feeling-color associations;
- 2) feeling-EEG component associations; and
- 3) feeling-color associations that were neither habitual or associated with specific EEG components.

Dr. Brown has suggested that the last-named area represents the pre-conscious stage of the association process.

With reference to this finding, the investigator commented that the card-sort technique had proved to be a fortuitous choice as a research tool because it had enabled her to quantify the activities of these subjective areas. She added that "the attempt to quantify pre-consciously organized associations provides a paradigm for studying relationships between experiential and perceptual data."

What did not shed any light on the association-forming process was the detailed analysis of brain activity that Dr. Brown carried out. Thus, only one possibly meaningful relationship emerged between aspects of subjective activity and variations of amplitude and frequency in the EEG components. This was the investigator's finding that beta amplitude was significantly larger among subjects who were best at sorting the descriptors to the colors representing the EEG frequencies. The uninformative results of the analysis were not entirely unexpected because, as the investigator pointed out, "currently available techniques for EEG analysis provide only a fraction of the information about brain electrical activity which might be found to relate to complex subjective activities. . . . The fact remains, however, that subjects were able to identify in a quantifiable way some aspects of subjective activity associated with aspects of brain electrical activity."

The question therefore remains to be answered: What physiological cues did the subjects employ in forming their feeling-brain activity associations? Dr. Brown suggested that methods of EEG analysis other than those generally used might yield testable hypotheses—for example, analysis of temporal or spatial patterning, space-time event patterning, or ranges and mixtures of identifiable EEG components which are not usually measured.

. . . And How It Differs from Conditioned Learning

As noted above, Dr. Brown arranged the conditions of these feedback experiments so that all programming would be initiated and carried through by the subjects themselves. She did not, in other words, start them off in the experimental model of operant conditioning in which the experimenter decided which behavior will be reinforced and what the reinforcement will be. Thus, Dr. Brown pointed out, the conditioned-learning elements of response and reinforcement could not be separately identified in the feedback circuit of these experiments. Indeed, none of the circuit relays—i.e., feeling stage, EEG frequency, light signal—could be separately identified; each could correspond to any two of the three conditioned-learning elements of stimulus, response, reinforcement. Dr. Brown elaborated these important points as follows:

"In the feedback system used, *programming of the reinforcement is internal*, and is a function of actively relating subjective activity to an external indicator which operates only when a specific EEG activity is present. Successful operation appears to require some internal effort by the subject: He generates both the 'response' (identification of a subjective state) and the reinforcement signal, and in addition selects the criteria for significant

values of the reinforcement indicator. The subject selects the criteria for reinforcement (color, light on-ness or off-ness, intensity, temporal sequencing, etc.) such that he generates a signal appropriate to produce that reinforcement. The circuit of the feedback system is either closed and operating or is not closed and not operating. Reinforcement cannot occur in the absence of a continued effort both to specify and generate it, and cannot be separated from the EEG 'response.' The reinforcements are, in fact, externalized EEG events.

"In the feedback system the entire learning process is internally directed. Subjective attributes of motivation, reward, error, anticipation, etc., stem from the verification of an internal event. The characteristics and attributes of the phenomenon classify it as an awareness or cognitive function. It is, ultimately, *the awareness of the relationship between subjective activity and the light signals operated by EEG activity which is the 'response.'* The unconscious awareness of this relationship or its formation may serve as a bridge or 'temporary connection' needed to complete formation of the response."

Finally, in further support of this view of feedback learning as different from conditioned learning—indeed, unique—the investigator noted that subjects' acquisition of the new skill had occurred much more rapidly and was retained, without practice, over a longer period than would be expected if the skill were a function of conditioning.

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Voluntary Control of Internal States

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Over the past four years Dr. Elmer E. Green and his colleagues have been exploring man's latent capacities for self-regulation and self-awareness. As a first step they developed a unique program for training ordinary people, Kansas housewives and college students to bring under volition certain psychophysiological processes customarily considered to lie outside the bounds of voluntary control. Through the use of electronic instrumentation designed to feed back to the subject information about the ongoing status of these processes, the training program aims to help the subject learn to regulate voluntarily such "involuntary" activities of his body. It is the researchers' hypothesis that this feedback instrumentation will significantly shorten the time needed for learning.

For the initial stage of the research three physiological functions were selected for training, two subject to peripheral nervous system control and the other under the influence of the central nervous system. Thus, the subject learns to relax striate muscle tension in his forearm down to the zero level; to increase the temperature on the skin of his hand by relaxing the smooth muscles embedded in the walls of blood vessels; and to increase the output of alpha and theta rhythms produced by his brain. (The electric potentials generated by the brain are detected by electrodes pasted on the scalp and traced on a paper record known as an electroencephalogram or EEG. The fluctuating voltages are rhythmic and their tracings look like waves—hence, they are called brain waves. The record is divided into four frequency bands: frequencies of 0.5–4 cycles per second are in the delta band, the 4–8 cps range is theta, the alpha band is 8–13 cps, and

beta waves are predominately 13-26 cps. (though they can be higher).

Although such extensions of volitional control over physiological processes are of enormous interest in their own right, in this research their attainment is but the means to an end. The ultimate goal is to study the subjective state that accompanies achievement of the training tasks. As a person succeeds in simultaneously dissolving tension in striate and smooth muscle through control of peripheral nervous activity and in generating alpha and theta waves more or less continuously, the investigators postulate that his attention will turn inward and he will experience a subjective state of intensely heightened self-awareness. This state is the researchers' quarry. What other physiological changes occur in the transition to this state? What personality traits are associated with success at its attainment? What are the qualities of mind? What sorts of feelings, imaginings are experienced? Is learning or memory enhanced in this state? Does consciousness expand into normally unconscious regions? And so on. If people can be taught to evoke such unusual internal states voluntarily, under laboratory conditions, then a host of fascinating problems become amenable to scientific inquiry for the first time.

Positive findings are beginning to emerge from the work completed so far, where about 100 housewives, students, and other adults have gone through various types of training procedures, with and without feedback instrumentation, in pilot and full-scale experiments and studies.

In general, the investigators have found that the subjects were fairly adept at enlarging their capacity for physiological self-regulation, and that feedback devices did indeed speed the learning. After training periods ranging in length from one to eight sessions, subjects could reduce forearm muscle tension down to extremely low levels and warm their hands perceptibly, sometimes astonishingly (10 degrees F. within three minutes). Large increases in the output of alpha-frequency brain waves were achieved by subjects whose pre-training alpha output was 30 percent or more during a three-minute test period; however, subjects whose baseline alpha output was less than 10 percent did not learn to increase the amount substantially.

The data have also begun to yield some hints about the subjective attributes of internal awareness during peripheral relaxation and high alpha generation. In some subjects, for example, deep striate muscle relaxation alone was found to be accompanied by body-image changes which occasionally culminated in profound

feelings of disembodiment. Similarly, by itself warmth control very often associated with a pervasive sensation of tranquility. Other evidence suggests that subjects who were best at maintaining abundant alpha production *while* speaking to the experimenter also scored better in a memory test. Further, the investigators recently started to followup a very promising lead which their studies uncovered. This line of inquiry concerns the state of internal awareness associated with production of brain waves in the theta band of the EEG.

The Menninger scientists discovered that subjects who could produce long trains of theta waves experienced strange, dream-like imagery. The scenes that emerged into awareness were different from daytime fantasies in that the subject was not willfully producing and directing them. They were more like the dreams of sleep except for one critical difference—the subject was awake and able to describe his visions to some extent as they unfolded. Vivid, phantasmagoric, symbolic in content, these extraordinary images seem to arise from an inwardly reflective state of deep reverie. But their exact source and nature, their possible meaningfulness are mysteries which the investigators are now attempting to fathom. An important question is whether subjects can be trained to generate theta waves and low-frequency alpha waves at will.

BACKGROUND

Man has always sought to know himself. In this light, the attempt to investigate states of enhanced internal awareness appears to be the latest version of an age-old quest. Although the goal of the research is a familiar one, the approach to it is entirely new. This is true not merely for the obvious reason that tools of modern science are being brought to bear on the problem for the first time. Rather, the uniqueness of the Menninger approach lies in its integrated utilization of knowledge from three disparate sources. One source is the Eastern practices of yoga, an ancient mind-body philosophy whose roots are in India. Another is the system of psychotherapy called Autogenic Training, which was developed in Germany some 50 years ago. Physiological feedback, or biofeedback, training is the third source; it is an experimental method for learning self-control that has been developed primarily by American scientists during the last ten years. Capsule descriptions of these three fields follow below, with emphasis on their contributions to the conceptual framework and methods of the Menninger research.

Yoga and the Centrality of Volition

States of intense self-awareness have held an abiding fascination for Dr. Green and his wife and constant collaborator, Alyce M. Green, who is also a psychologist. Throughout the course of his scientific career, which now spans nearly three decades and includes training and research work in physics and biopsychology, Dr. Green has pursued a basic interest in yoga. Especially intriguing to him was a meditative state of highly concentrated, focussed attention, which he wanted to investigate in detail. During the first several years of his acquaintance with yoga, however, it seemed unlikely that he would ever be able to study it because such psychological states were unapproachable by the methods of scientific inquiry.

Nevertheless, the Greens continued studying the texts of yogic practice to learn what they could of the objective techniques used to progress from novice to master. Volition seemed to be the key; specifically, extensions of volitional control over neurophysiological processes ordinarily beyond the reach of conscious manipulation. Thus, the ability to concentrate awareness in one sharply circumscribed locus for extended periods of time implied an extraordinary degree of control over the functioning of the central nervous system (CNS). Moreover, it was clear that the yoga student's practice in voluntary control followed a prescribed sequence. In order to exert control over CNS functioning, he had first to work at enlarging his capacities of control over various physiological processes of the peripheral section of the autonomic, or involuntary, nervous system. (Those spectacular feats of physical endurance which unfortunately constitute the only knowledge most Westerners have of yoga are instances of peripheral autonomic control. For example, control of heart rate and respiration make it possible to be buried alive, and control over pain sensors permits one to recline on a "bed of nails" with impunity.) The Greens concluded that learning to control peripheral autonomic functioning was a practice useful for achieving control of CNS functioning.

"We asked ourselves why this should be so," Dr. Green recalled, "why if you want to enhance internal awareness it is useful to begin by expanding your capacities of physiological self-regulation."

Their answer, heuristic and necessarily tentative, is two-fold. First, extensions of autonomic control, difficult as they are, are easier to achieve than extensions of central control. It is in this sense that the former might be good practice for the latter. And second, because body and brain function interdependently, it is

reasonable to postulate that body changes in certain directions—specifically, toward a pervasive quiescence—may provide the most propitious conditions for the changes in brain function that result in extraordinary control of awareness.

Thus, from yoga the Greens derived certain propositions. A relatively easy path to states of enhanced self-awareness seemed to start at the autonomic nervous system, and volition was the key to success. But here was a riddle, for how can volition affect involuntary processes? The answer to the voluntary-involuntary riddle in Eastern terms was highly metaphysical, quite unsuitable to Western scientific research. A way to begin working on the riddle with Western techniques occurred to the Greens when they learned of a European system of psychotherapy called Autogenic Training, in which the relationship between volition and the involuntary nervous system was being demonstrated by medical doctors. Here was a development that made it feasible to study yoga from a foothold in Western science, using Western terminology.

Autogenic Training and "Passive Volition"

Although Autogenic Training is all but unknown to American doctors, a number of European practitioners use it, reporting effectiveness mostly in psychosomatic and neurotic disorders. Basically, it is a form of autohypnosis, with particular attention given during the early phases of training to achieving deep relaxation of the body.

The system was developed by Johannes Schultz, a German physician active during the first third of this century. Schultz had done research in hypnosis and concluded, as did Freud at about the same time, that hypnosis was very limited as a therapeutic tool. Nevertheless, he was curious about persistent reports from his patients on two characteristic sensations of the hypnotic mode—a feeling of heaviness, followed by a sensation of warmth in the extremities. Schultz resolved to study these sensations more closely in order to learn whether the psychophysiological mechanisms responsible for provoking them could be called into play by autosuggestion, that is, by the patient's own effort. He believed that hypnosis could become far more useful in medicine if the patient himself, rather than the doctor, induced the hypnotic state. Gradually, over several years of experimental study and clinical experience, Schultz developed these seminal ideas into the system he named Autogenic (that is, self-generated) Training. Interestingly, in its final form the system incorporated certain of the volitional aspects of yogic practice along with techniques of medical hypnosis.

The patient in Autogenic Training is instructed mainly in the use of what Schultz referred to as "passive concentration." The Greens modified this concept to include "passive volition." This consists in desiring and vividly visualizing a physiological state and then "letting it happen"—that is, allowing the body to carry out the needed changes without attempting to use active will power.

Although the phrase "passive volition" is self-contradictory, there are hundreds of cases in the annals of medical hypnosis attesting to the fact that it denotes a real phenomenon. A recent example, which was filmed in color for training purposes, is the case of a Michigan obstetrician. His patient, who could not be given anaesthesia, was hypnotized for a Caesarian section operation. Incision, freeing the infant and removing placenta, closure of the wound were all done while the patient was in the hypnotic state. She had been told that she would be cool and completely comfortable and so she was throughout the ordeal. She felt no pain, perspired not at all (the doctors themselves were dripping perspiration), bled very little. The moment the doctor lifted the infant from the womb, umbilical still unsevered, he asked the woman to look at her baby and tell him the sex. "Oh, it's a boy," she replied, craning her neck to see, then relaxing again with eyes closed.

How did the woman attain this astonishing control over the involuntary processes regulating pain perception and bleeding? Not through the exercise of will power, certainly, for active volition would be even more futile in this condition than it is in the somewhat comparable situation in which a person fails miserably if he tries to will himself to relax and fall asleep. Rather, another sort of nonvolitional psychological control was mobilized by the hypnotic mode, a detached and effortless volition, "passive volition."

The point to be made, then, is that in Autogenic Training Dr. Green discovered both a concept and certain methods that could be used to study how a person can gain voluntary control of his internal states. The concept, of course, was self-directed passive volition, and the methods were the verbal techniques for mobilizing passive volition that Schultz and his followers had evolved.

Dr. Green first learned about Autogenic Training in the late 1950's at the University of Chicago, where he was earning a doctorate in biopsychology (his second science degree; for 15 years prior to this he worked as a physicist, mainly in rocket and guided missile research at the Naval Ordnance Test Station in China Lake, California). By the time he came to the Menninger Foundation in 1964, he was eager to explore Schultz's methods

more fully, for his preliminary work with them indicated they were indeed an effective and scientifically acceptable means for studying the control of autonomic processes. The only problem was that achieving control required a minimum of several months of practice and, in the context of a research project, that was an inordinately long period of time. However, Dr. Green thought he knew a way to overcome this obstacle: he proposed to use autogenic techniques in conjunction with physiological feedback instrumentation, and thereby to telescope the time requirements from several months to a few weeks.

Feedback Training and the Time Factor

The phrase "physiological feedback" refers to the instantaneous presentation to an individual of information about his internal processes—physiological information is fed back to its source.

For instance, a thermometer is essentially a feedback instrument albeit a crude one. It presents information (number of degrees F.) to a person about his internal processes (the several influencing his blood temperature) with a time-lag of a few minutes. Most of the physiological feedback devices used today are much more complicated in design and operation, and capable of far greater resolving powers than the thermometer.

These newer devices were made possible by the proliferation of electronic technology after 1945. Thus, they consist of such components as sensitive transducers, transistor-powered telemetering bits, and high-gain amplifiers, and they can continuously detect, transmit, and amplify precise information about any aspect of functioning—from gastric secretions to blood pressure changes to the minute frequency oscillations of brain waves. The information is usually channeled through a computer programmed to filter out the data meeting certain criteria; only these selected segments of the data are actually presented in an external mode. External presentation can be made in many forms. Light displays have been used by researchers, as have tones and other auditory signals. Similarly, the amount of information given to a feedback subject can vary from a scant on-off of light or tone, for example, to richly informative alternations in a light's color or intensity, which might signify quite subtle gradations of change in the ongoing internal process.

What use can be made of these sophisticated electronic devices? The answer is this: when a person uses feedback instruments to show him what is happening in his heart, gut, or brain, he can learn in a very short time to control those portions of the physiological processes he has become aware of through feedback.

The staggering implications of this fact for clinical medicine

and psychophysiological research are just beginning to be widely appreciated. Investigators interested in the new feedback training techniques are now rapidly increasing in number and, to foster an orderly growth of the field, they recently banded together in a new scientific association, the Bio-Feedback Research Society. Meeting for the first time in October 1969, more than 100 researchers shared both their findings and their enthusiasm for the exciting implications of feedback studies. The possibilities are indeed revolutionary. To cite just a few of the more obvious clinical applications: Using feedback instrumentation, ulcer patients can be trained to halt excessive secretion of stomach acids; coronary patients can learn to decrease heart rate and hypertensives to lower blood pressure; epileptic patients can learn to forestall attacks. In areas of basic research, Dr. Green's own studies are a good representative example of the sort of frontier research in consciousness now being carried out.*

Before leaving the subject of feedback training a word is in order about what it is that people learn to control. In Dr. Green's view, the phrases used by researchers in the field are misleading. Thus, an investigator is taking a semantic short cut when he speaks of "training the subject to produce alpha waves"; stated fully, he means "training the subject to produce *the subjective state that is associated with alpha waves.*"

In other words, Dr. Green continued, as far as we know brain waves have no sensory representation through which the subject could recognize them as such. What he can recognize, and then learn to manipulate, is the feeling that goes with one or another brain-wave pattern. This applies also to many other physiological processes, of course: gastric secretions, single muscle unit firings, vascular distension and contraction, and so on—none can be sensed *per se* yet all can be brought under voluntary control if subjected to feedback training.

As Dr. Green sees it, objective feedback information gives the subject a battery of cues to correlate his conscious feelings with the associated unconscious physiological processes of his body. At first, the desired physiological events occur only by chance, but when they do occur the feedback instrumentation in effect tells the subject—"Yes, this is it, keep it going." At that instant, the subject is informed that the feeling he is experiencing is the "right" one. Each time the feedback device registers "Yes"—the subject again has the opportunity to feel the right feeling and get to know it a little better. Little by little he learns how to produce that

*See also the studies of Dr. Barbara Brown described elsewhere in this volume.

feeling at will. And willy-nilly, with the feeling, the associated physiological processes are produced. Somehow, Dr. Green thinks, there emerges an awareness of a link between psyche and soma, and the subject learns to integrate the two.

At the risk of minimizing the undeniable importance of the new technology, it should be emphasized that the capacity to learn such control is inherent in every human being and that feedback devices simply rationalize and thereby enormously accelerate the learning process. Indeed, it is Dr. Green's opinion that the potential for self-regulation of psyche and soma in the human organism is practically unlimited. He has expressed this view by linking volition, which he feels is an essential element of man's nature, with a postulate he calls the psychophysiological principle: "Every change in the physiological state is accompanied by an appropriate change in the mental-emotional state, conscious or unconscious, and conversely, every change in the mental-emotional state, conscious or unconscious, is accompanied by an appropriate change in the physiological state." When considered in conjunction with man's demonstrated capacities for self-control, he points out, this principle implies the potential for total psychosomatic self-regulation.

SYNTHESIS

By the mid-1960's, Dr. Green had synthesized the ideas and techniques described above into a viable scientific approach to the study of states of enhanced internal awareness (for brevity, EIA states). And, with this approach as the foundation of the research design, he and his colleagues obtained NIMH grant support for research at the Menninger laboratories. To recapitulate and summarize, these researchers propose to teach subjects how to experience EIA states in a laboratory setting, reliably and within short time-spans, by a program called "autogenic feedback training"—an inspired amalgam of autogenic techniques and feedback instrumentation. The ultimate goal of the training—the production of EIA states—is to be approached by teaching subjects how to bring ordinarily involuntary physiological processes under voluntary control.

More specifically, the investigators use the following operational definition of an EIA state: "a state of consciousness in which the subject is not drowsy, but neither is his attention focussed on any sensory peripheral modality associated either with his body or with the outside world." This state is objectively identified by the presence of abundant and prolonged alpha and/or theta waves in the subject's EEG. Consequently, the *primary* training goal is teaching the subject to gain control of the alpha and theta compo-

nents of his brain's electrical activity. Because the investigators hypothesize that the difficult task of learning this type of central nervous system control can be facilitated by learning to control certain autonomic functions beforehand, the *intermediary* training goals are to teach the subject to relax striate muscles of the body and to increase the temperature of the skin of his hands by relaxing smooth muscles.

As for the investigation of the EIA states their subjects experience, the researchers have assembled a number of tests, including a few of their own invention, to explore these subjective domains. Before moving on to a detailed description of the study's design and implementation, and the results obtained to date, it would be useful to review what is now known about alpha and theta activation.

A Universe of Unusual States of Awareness?

Conscious alpha and theta activation in a subject's brain-wave pattern is the distinguishing characteristic of the EIA state these scientists are studying. Why alpha and theta activation? Is this type of brain activity essential to the experience of unusually heightened self-awareness?

The Menninger researchers based their choice of EEG criteria on two sources of evidence. First, there is the general consensus of the EEG literature, which may be summarized as follows.

The usual state of awareness that we experience during our waking hours is associated with brain activity in the beta-frequency range of the EEG (13-26 cps); intermittently, brief bursts of alpha waves (8-13 cps) occur (one out of ten people, however, produce virtually no alpha-wave activity during waking consciousness). Therefore, it seems that beta waves go with our problem-solving thinking in which attention is actively focussed on specific data in our external and/or internal environment. Alpha waves, on the other hand, seem to go with abstractions from such vigorous, concretely focussed mental activity; their occurrence in the EEG would be contemporaneous with our mental lapses, our instants of dreamy detachment in which awareness is present but is not fastened on anything in particular. These alpha bursts are ordinarily quite brief, giving way to beta waves in the split second when some stimulus captures awareness ("alpha blocking") or, conversely, being replaced by an EEG signal of theta waves alternating with mixed, low-voltage frequencies that indicates drowsiness and a general loss of awareness. Experimenters have found that alpha waves emerge in the EEG whenever a subject follows the instructions to relax, close his eyes, and think of nothing. Even though the subject may wish to comply fully, however, he is not

likely to maintain this undirected yet totally alert state concomitant with alpha generation for very long. Again, either alpha blocking occurs or the alpha pattern disintegrates into the theta- and mixed-frequency pattern which usually signals the loss of awareness. Experimentation has also shown that alpha waves occur when a drowsy, unaware subject, whose brain is producing a lot of theta, is given a gentle stimulus; the stimulus acts like a light prod to his nervous system, rousing him just enough to enliven awareness but not so much as to galvanize the beta-wave state of focussed awareness.

In sum, then, it is generally agreed that between full waking consciousness and the unconscious states of sleep, there lies a fragile state in which awareness is fully potent and free-floating. This state is associated with the presence of alpha waves in the EEG; it normally verges toward drowsiness and loss of consciousness as the theta state appears.

The second source from which the Menninger researchers draw is the interrelated literature on creativity, relaxation therapy, Autogenic Training, Yoga, Zen, and—the most recent material—physiological feedback training. There is much evidence here indicating that the alpha-theta, or AT, state, episodic and evanescent as it is under normal workaday conditions, can be deliberately cultivated under special conditions and made relatively long-lasting and impervious to disruption. Further, these reports suggest that conscious AT periods are often accompanied by an experiential state in which the subject's self-awareness reaches unusual intensity. In such a state, for instance, a neurotic patient might produce a highly creative insight into a personal problem that had long been impenetrable to his conscious thought. An EEG study of yoga adepts discovered that a deep meditative state was accompanied by continuous alpha production that was not disrupted by such irritating stimuli as the flash of a strong light in the yogi's eyes or the touch of a hot glass rod to his skin. Brain-wave patterns tended to show more theta as the meditation progressed.

Thus, the Menninger scientists' definition of an EIA state as one in which AT production is greatly enhanced is rooted in the findings of earlier work. To the extent they are successful in their own work, of course, the definition will be considerably broadened, and we will be able to describe this state of unusual awareness with a great many objective terms. When that happens we will be able to ask meaningful questions about the existence of other unusual states of awareness.

Even at this point in time, however, when we are so pathetically ignorant of the workings of our own nervous system, there is

reason to think that the AT-activated EIA state is only one kind in a whole universe of unusual states of awareness. In this context, the often-quoted words of William James come to mind: "Our normal waking consciousness is but one special type of consciousness, whilst all around it, parted from it by the filmiest of screens, there lie potential forms of consciousness entirely different . . . they forbid a premature closing of our accounts with reality." So wrote the great psychologist-philosopher at the turn of the century and, like most workers involved in studying consciousness today, Dr. Green and his colleagues think this view a reasonable one.

Indeed, in an effort to enlarge our meager knowledge of unusual states of awareness, the Greens have been instrumental in organizing a series of interdisciplinary conferences, which have been held at Council Grove, Kansas, in each of the last three years. The three-day 1969 meeting was attended by researchers involved in studies of biofeedback training, hypnotism, environmental deprivation, and hallucinogenic drug effects, and by scholars of such ancient systems for altering consciousness as Tibetan and Zen Bhuddism, Yoga, Sufism, and Christian mysticism. Their discussions about the similarities and differences among the unusual states of awareness known in their several fields produced many new research ideas, including some for collaborative, cross-disciplinary work. Perhaps the most valuable accomplishment of the conference, however, was simply to have brought the participants into contact with one another. For this has resulted in the establishment of a nascent, interdisciplinary science of consciousness, a science which seeks to develop the tools and methods for piercing James' "filmiest of screens" and thereby show us how we might become more fully ourselves, more fully integrated through techniques of voluntary self-regulation.

SETTING UP THE STUDY

Virtually every piece of hardware needed in the study had to be custom-designed and built by Dr. Green and his co-workers. So, too, with the procedures of training, the scoring methods, the tests for exploring the parameters of the EIA state—the researchers developed all of them. The solutions they devised are described in the following sections.

Pilot Work with Autogenic Training

The investigators learned how to instruct people in the use of passive volition in a series of pilot training sessions. The subjects in this work, most of whom were housewives from the Topeka area, were taught to achieve control of striate and smooth muscles,

and thereby to relax deeply and to increase the skin temperature of hands and feet. No feedback was used in this phase of the research project.

Time and again the researchers found that when a subject was told to relax and warm her hands, invariably her muscle tension would increase and her hands get a bit colder. In other words, what occurred was just the opposite of what was desired. Presumably this happened because the subject was saying to herself, "I am going to relax!" But her use of active volition, the sort all of us know best and call on most often, was actually antagonistic to her goal. Subjects were successful, however, when they managed to carry out the researchers' instructions simply to *feel* such sensations as warmth, quietness, heaviness—to visualize heat flowing into extremities, e.g., and then passively allowing it to happen.

Realizing that the unfamiliar atmosphere of a scientific laboratory might be faintly threatening to their subjects, and therefore not an ideal place in which to call forth a passive, accepting mood, the researchers strove to make the sessions informal and relaxed. One important contribution to this end was their invention of a cloth jacket seamed with fine insulated wires and hemmed with multiple-plug connections. Its purpose was to minimize the "electric chair effect" by making it possible to fasten the necessary electrodes and thermistors to the subject's skin several minutes before training was to begin and to do so in a room other than the training room.

In practice, the subject had the leads attached soon after arriving for a session; she slipped into the jacket then, and the leads were plugged into its connections. Then she moved freely around various areas of the laboratory for the next few minutes, unencumbered by dangling wires, before going to the training room, where she sat in an upholstered easy chair. The jacket's plug connections were quickly and unobtrusively snapped into cables leading to the data-control room, and the evocation of a passive mood began forthwith.

The researchers think that the jacket has indeed eliminated a source of anxiety for the subjects, and it is now used routinely.

The idea for another invention of lasting value, the differential temperature indicator, DTI, also came out of the pilot studies. This is a feedback instrument that measures and displays the temperature difference between two skin areas. It consists of a box of electronic components, small and light enough to be held in one hand, from which two long wires tipped with thermistors extend; the box is faced with a meter whose needle indicator sweeps right or left in correspondence with the changing temperature differential.

It was the experience of a pilot subject whose migraine headache disappeared when she succeeded in warming her hands that led Dr. Green and Dr. Joseph Sargent, an internist at Menninger who is interested in the etiology of migraine, to develop the notion that relaxation of smooth muscles of the periphery, which causes an increased blood flow there and leads to increased skin temperature, may relieve the pain of migraine by inducing blood to flow away from the head. This, in turn, would cause a decrease in temperature on the skin of the forehead. If this is so, they reasoned, then a person could dissipate migraine pain by learning to warm his extremities and cool his forehead simultaneously. Dr. Green constructed the first DTI to test this notion. Preliminary results have been encouraging, and Dr. Sargent has been carrying out a systematic study of migraine relief through training in voluntary control of blood flow with the DTI.

Detecting and Displaying the Key Physiological Variables

The electronic systems for detecting and displaying the physiological processes under study were designed and constructed by Dr. Green and Rex Hartzell, chief engineer of Menninger's Biomedical Electronic Laboratory. As noted earlier, the key physiological changes that were to be voluntarily controlled were: smooth muscle relaxation (which would lead to an increase in temperature of the hands), striate muscle relaxation (measured in the forearm), and increased alpha-wave generation.

Temperature. Thermistors taped to a finger of each hand, or to the right hand alone, are used to detect skin temperature; they register changes as small as one fiftieth of one degree Fahrenheit.

Striate muscle. Tension levels are detected by surface electrodes taped to the right forearm. The researchers attempted to compensate for the variations between subjects in the amplitude of the electromyographic (EMG) signal—variations which arise because of idiosyncratic skin characteristics, amount of underlying fat tissue, electrode placement, and the like—by the use of a hand dynamometer squeeze test, which allowed them to adjust the polygraph pens so that these would be deflected 50 millimeters by each subject's squeeze force of one kilogram, and by building an equalizing potentiometer into the circuitry. The system was reliable in detecting signals throughout the range of activity, including single motor unit firings, and in registering total neuromuscular silence. (Dr. Green notes that the conventional notion that there must always be *some* activity in striate muscle is quite mistaken. He cites the summary comments of a foremost student of neuromuscular problems, John V. Basmajian. According to Basmajian: "... the usual definition of 'tone' should be modified to state that

the general tone of a muscle is determined both by the passive elasticity or turgor of muscular [and fibrous] tissues and by the active [though not continuous] contraction of muscle in response to the reaction of the nervous system to stimuli. Thus, at complete rest, a muscle has not lost its tone even though there is no neuromuscular activity in it. . . . In no muscle at complete rest has there been any sign of neuromuscular activity, even with multiple [deep-implanted needle] electrodes. . . .").

Alpha-wave generation. Brain activity in the alpha-frequency range is detected by two electrodes pasted to the scalp over the occipital region, and positioned right and left of the center line; a third electrode is pasted at the vertex of the skull for purposes of reference. The occipital region is located at the very back of the head, directly opposite the eyes; functionally, its cortex is the visual projection area of the brain.

The signals from fingers, forearms, and scalp are transmitted into their separate circuitry systems. These systems are arranged so that a certain amount of the continuous stream of data flowing into them is filtered out and presented to the subject in whom the signals originated. In other words, a closed feedback loop is established.

In each instance the data selected for feedback bear no more information than the subject needs to learn the training tasks. For example, from the voluminous quantity of raw data coming from the scalp electrodes, only two bits of information were selected for feedback to the subject in the early experiments. One was whether or not alpha waves were occurring on the instant, and the other was the percent of alpha that occurred during the previous ten seconds.

Feedback information is presented visually. Specifically, a black-painted panel board, placed a few feet in front of the subject, holds glass windows $\frac{1}{2}$ inch wide and 5 inches high in which a bar of light rises or falls in correspondence with the ongoing physiological activity. The feedback circuits are arranged so that the light bar rises as the desired physiological change occurs. Thus, the light in the bar for muscle tension rises to the top when total neuromuscular silence obtains; that in the temperature bar when skin temperature increases 10° F.; and that in the alpha bar when alpha is present 100 percent of the immediately preceding 10 seconds. In addition, a single light flashes on when alpha is present at that second.

In addition to the visual display techniques, the investigators have also developed an auditory system for the feedback of brain-wave information. They built the system as follows. Electroencephalographic filters and tachometers, E-tachs, are constructed for

each of the four EEG frequency bands. The E-tach voltages, which are proportional to the frequency of the signals they detect, are then made to operate oscillators which multiply the original frequency by 200. The resulting signals are in the auditory domain—e.g., alpha waves at 10 cps are increased to 2,000 cps, beta waves at 18 cps become signals of 3,600 cps, and so on. The E-tach voltages are also used to modulate the intensity of the sound according to the amplitudes of the original EEG signals. When the signals are combined, the brain's ongoing electrical activity is heard as a complex, surprisingly harmonious sound which bears an auditory relationship to the original EEG signals. Dr. Green describes it as "a pleasant modernistic biological music—the music of the hemispheres," we might call it." Signals from right and left occiput can be listened to stereophonically, through stereo earphones or speakers; optionally, amplification can be made of the signals from only one side of the brain.

The researchers are finding that the auditory feedback system is especially useful in training a subject to control AT brain-wave production, a possibility which they have recently begun to examine. Learning voluntary control of these rhythms—"alphoid" rhythms as some researchers call these signals, which are in the frequency range, 6–9 cps—is more difficult than learning to produce the higher frequency alpha waves. The researchers postulate that control might be easier to achieve if a subject has both visual and auditory feedback to guide him. They have begun to test this idea in preliminary work with a few subjects by adding a light bar for theta waves to the visual feedback display and providing earphones for auditory feedback as well.

"Our purpose in developing this auditory system," Dr. Green explained, "is to provide the subject with realistic cues concerning his occipital brain-wave patterns. If specific patterns are to be controlled, we feel it is necessary to provide specific information to the subject. This brings up the question of how much information the subject *can* make use of without being overloaded. Our hypothesis is that in a way similar to the development of any other skill, the successful use of EEG feedback cues will depend on practice. At first, a large fraction of the information will probably not be used, but as skill develops the original complexity will perhaps seem quite simple."

Scoring Methods

Temperature. A subject's score is based on the temperature change in degrees Fahrenheit he can produce in a given session.

Striate muscle. Muscle tension is scored in reference to the hand dynamometer calibration and is calculated over 30-second blocks

of time. A subject's score reflects both his performance relative to the most tense member of his training group and his performance as the session proceeds relative to his own initial (no feedback) baseline.

Alpha- and theta-wave generation. These are easy to score because minimum and maximum values of zero percent and 100 percent are possible over a specified period of time. After trying periods of varying duration, the researchers decided on a 10-second epoch. Thus, a subject's initial levels of alpha and theta, expressed as percentages appearing in the EEG in a 10-second period, lie between zero and 100 percent. His final score is the sum of this initial value and the value achieved after training. The researchers use these criteria for EEG feedback: frequency, 8-13 cps for alpha and 4-8 cps for theta; minimum amplitude, 15 microvolts; minimum duration, 0.4 seconds.

The Search for Correlates of Voluntary Control

Before and after the sequence of training sessions and at specified times during training, a number of standard psychological tests are given to subjects in order to discover any associations that might exist between personality traits and ability to learn voluntary control of internal states. The investigators selected tests which probe a subject's inward-outward orientation and his psychological flexibility. The after-image test, devised by Dr. Green, is also administered; it is concerned with determining characteristics of retinal-cortical processes in each subject.

The search for correlates of voluntary control also involves monitoring a number of psychophysiological variables in addition to those already mentioned—specifically, galvanic skin resistance and skin potential, respiration, heart rate, and plethysmographic response. These data are useful in exploring such questions as these for example: Does the subject's general level of neurological activation change in the transition from the alpha to the theta state? Does voluntary alpha or theta activation influence heart rate? Do they affect, or depend on, regulation of breathing? The data describing these variables are obtained continuously during the course of each training session. Thus, in addition to following the flow of information about muscle tension, temperature, and brain waves, the researchers can also monitor other aspects of physiological functioning.

Although most of the huge mass of data gathered in each training session is recorded raw on magnetic tape, signal-handling and data-reduction systems are designed so that information immediately relevant to study questions is presented on-line. Dr. Green considers on-line computation an essential feature of the project

design because it gives the experimenters rapid feedback about the effectiveness of their procedures; consequently, they can make modification as soon as the need for such arises, and thereby make efficient use of training time.

TRAINING FOR EXTENSIONS OF VOLUNTARY CONTROL

Most of the experimental subjects are young college men, freshmen and sophomores at Washburn University. Initially they were to come once a week for a total of eight training sessions. After some experience, however, Dr. Green and his colleagues concluded that this schedule was too attenuated for effective training, and they decided to have subjects come twice a week for four consecutive weeks. No training is given during the first session, which is used instead to acquaint the subject with the setting and procedures of the laboratory, with the electrodes he will wear during training, with the people who will work with him. The remaining seven sessions are devoted to training. Each lasts about 2 hours, and includes 40 minutes or so for fastening into place the various devices used to monitor physiological activity.

Control subjects are included to test the hypothesis that feedback instrumentation greatly accelerates the acquisition of voluntary control. They go through the same schedule of lab visits as the experimental subjects; they, too, are "wired-up" each time and receive the same instruction in autogenic techniques. In the training room, however, the movement of light in the bar meters, which they are asked to watch and occasionally describe, is totally irrelevant to their autogenic tasks. In short, they receive no feedback training.

The Greens explain that a typical training session unfolds in several discrete phases. In their words, this is how it transpires.

"After the subject is comfortably seated he closes his eyes and relaxes for 3 or 4 minutes while various recording machines are adjusted. Then,

"1. Relax with eyes closed, no feedback, for 3 minutes.

"2. Relax with eyes open, no feedback, 4 minutes.

"3. Maintain relaxation and visualize warmth with eyes open, no feedback, for 4 minutes.

"4. Maintain relaxation and warmth, and establish a quiet, inner-focussed and alert state of mind, no feedback, for 4 minutes.

"5. Training with muscle tension feedback meter; 3 minutes with autogenic phrases for relaxation initiated by the experimenter, followed by 4 minutes of practice without phrases. Relaxation phrases, of which about eight are used, follow a typical pattern. Three such phrases are, 'I feel quite quiet.' 'My feet are heavy.' 'My ankles, my knees, my hips, feel relaxed and heavy.'

"6. Training with muscle tension and warmth meters; 3 minutes with several autogenic phrases for warmth initiated by the experimenter, followed by 4 minutes of practice with phrases. A typical warmth phrase often emphasizes both relaxation and warmth. For instance, 'My hands are heavy and warm.'

"7. Training with muscle tension, warmth, and percentage-of-alpha meters; 3 minutes with autogenic phrases for alpha enhancement initiated by the experimenter, followed by 4 minutes of practice without phrases. For control of percentage of alpha we have devised autogenic-like phrases that focus attention inward, away from the outside world, and emphasize the quiet but alert mind.

"8. Twenty minutes of free practice with three meters.

"9. With feedback meters switched on, subject attempts to maintain peripheral nervous system passivation and central nervous system alpha-activation during discussion and interview, about 12 minutes."

As this description so clearly indicates, the procedure within which training occurs is beautifully spare—nothing is imposed, all control lies in the subjects hands; he is the one doing all the work, at his own pace, as he learns to integrate, or perhaps the word should be reintegrate, the processes of his nervous functioning.

The Recall Test—Direct Probe of the Alpha State

During the second session, subjects are given the first part of the two-part recall test. This is the instrument used to probe the subjective nature of enhanced internal awareness. The Greens designed it specifically to test their hypothesis that an individual's recall ability is enhanced in the alpha-activated state. The basic strategy is to measure the subject's ability to recall certain material when he is in his usual state of consciousness, then to compare this baseline score with the measure taken of his ability to recall the same material when in a state of alpha activation. The material used in the test is a few short news magazine stories about current events of interest to students such as race problems, drugs, the Vietnam War, campus unrest.

For the first part of the test, the subject is instructed to read the stories carefully; he is told he will not be tested on their contents but will simply be asked to tell the stories to the experimenter. About half an hour later he is asked to recall as much as he can of each story. The material he recollects is then scored for retained items. This score constitutes the baseline measure of his recall ability.

The second part of the test is given about three weeks later. On this occasion, the subject attempts to keep all feedback meters as

high as possible, especially the one registering percent of alpha. After 12 minutes the feedback meters are turned off and he is asked to remain in the passive, alpha-activated state he has attained *while* he tells again as much as he can of the news stories he read three weeks earlier. As before, the material recalled is scored for retained items. This score, of course, constitutes the measure of his recall ability while in the enhanced alpha state.

Early Results of the Project

At the time of this writing in mid-1970, about 100 subjects have gone through various procedures of training for extensions of voluntary control. Twelve of these were experimental subjects who received the full-scale autogenic feedback training program, what Dr. Green has called the triple training program. The results that can be described at this time are the first findings of the study, preliminary and in some instances tentative. Although they clearly demonstrate that naive subjects can learn to control aspects of their physiological functioning, they only suggest what the nature of the alpha-activated EIA state might be. They do indicate, however, that the Menninger research project will in time produce substantial advances in our knowledge about consciousness, especially in respect to the relation between theta waves and consciousness.

The findings pertaining to physiological self-regulation and the subjective changes accompanying self-regulation may be summarized as follows.

Voluntary increase of warmth in the hand did not come easily with just a few practice sessions in the laboratory. Some subjects had very little success, a few succeeded to a remarkable degree, and a few performed phenomenally well. One pilot subject, for example, produced an increase of 10 degrees F. in less than 10 minutes, but he, having practiced yoga for many years, could not be considered naive. The data suggest that blood flow control in the hands is easier for women than for men. Nevertheless, there were more changes in the positive direction in the autogenic feedback group (who were all males) than among the group of housewives given autogenic training without feedback.

In the migraine headache study that grew out of the voluntary controls project, 11 of 12 patients learned to make significant increases in the temperature of hand relative to forehead; the range of differences was 5-20 degrees F. Most have experienced relief of migraine pain and have been able to cut down on their drug needs during migraine attacks. The migraine patients worked at home with portable temperature meters for about a month after their guided practice in the laboratory.

The difference in the amount of control achieved by college students and migraine patients could be due to the age difference, to the difference in sex (most of the migraine subjects are women), to a difference in motivation, and to the fact that student subjects were attempting to learn control of three variables instead of one.

The researchers feel "that practice at home for 15-20 minutes a day during the one-month training period, using autogenic phrases and visualization, will enhance the efficacy of the feedback sessions in the laboratory and will, of course, also make it possible for the skill developed to be more easily applied." One of the pilot subjects, for example, overcame a long-standing problem with insomnia because she learned to warm her feet in bed.

Typically, warmth control was associated with subjective feelings of serene well-being.

Although prolonged neuromuscular silence was not achieved by any experimental subject, all attained unusually low levels of tension in the forearm, often in a single session. Many found this difficult to maintain when first they shifted their attention to control of warmth or alpha-wave generation, but the skill returned with further practice. Compared to training with autogenic phrases solely, feedback instrumentation was found to accelerate the learning of muscle control considerably. Further, the investigators made an interesting observation about the discretion in control that is possible: "We have also found that a normal subject can learn, with a little instruction and practice, to dissociate his right forearm from the rest of his muscular system to the extent that he can tense his abdomen, left arm, leg muscles, or neck muscles, without causing any observable increase of tension in the right arm."

Body-image changes were associated with control of striate muscle tension. Some subjects reported unusual changes in their sense of arm or hand: "My arm feels like a bag of cement. . . ." or ". . . as if it was moving away from me"; another said, "I had to look at (my hand and arm) to see if they were still in the same place." Other subjects experienced even more profound body-image changes: "I'm not even sitting here. I feel like I'm just detached in some way . . . you know, if I create some sort of image I feel as though I'm just there."

As chance would have it, two of the experimental subjects who received alpha feedback training were among that 10 percent of the population who produce virtually no alpha waves in the EEG. Analysis revealed that they were able to produce only a slight tendency toward an increase in alpha-wave generation, from 3 percent to 7 percent. The average increase of alpha was 30 percent

for the other subjects. For comparison, the average increase obtained by control subjects using autogenic phrases without feedback was found to be 15 percent.

The results of the recall test provide some preliminary data about the subjective attributes of a state of abundant alpha-wave generation. With reference to the scores obtained by the nine alpha-producing experimental subjects and a group of control subjects in the second, or delayed, recall of the prose stories, the researchers found that the subjects who remembered the most material were those who produced the highest percentages of alpha rhythm while they were recalling and speaking to the experimenter (a voice-operated event marker ticked the EEG every time the subject spoke). Thus, it appears that the ability to recall items from one's memory may be increased during the alpha-activated EIA state.

No definite statements can yet be made about personality or physiological correlates of voluntary control. The investigators have uncovered one tentative correlation, however: Subjects who were good at producing alpha waves also 1) scored as so-called high-movers in the autokinesis test (that is, they saw a stationary pinpoint of light as one which slid and slithered about) and 2) reported seeing a sudden, intensely red after-image following a single exposure to a bright white light. This particular alignment of characteristics suggests that those with a talent for generating alpha waves may be more introverted than extroverted in personality and, moreover, that both these characteristics may be functions of their neurological endowment.

New Directions: The Most Recent Studies

As data reduction and analysis continues apace, a number of other findings will emerge from this work, and some doubtless will suggest new, testable, hypotheses about voluntary control and unusual states of awareness.

Meanwhile, Dr. Green and his associates have already begun to pursue one of their most promising leads. These newest studies concern the psychophysiological processes and the contents of consciousness associated with a subjective state whose EEG signature is slightly different from that of the alpha-activated EIA state. The EEG signal of this state is a mixture of low-frequency alpha and high-frequency theta rhythms—the alpha-theta, or AT, rhythm mentioned above. An individual generating brain waves in the AT frequency range, roughly 6–9 cps, would be described as semiconscious or, less clinically, as in a state of deep reverie.

What first attracted the researchers' interest to this frequency range was their observation that, in its presence, dream-like im-

agery was often experienced. Such instances occurred several times during the course of a reaction-time experiment, for example. After a subject responded to a stimulus (the bump of a button under a finger) by pressing a button, he was asked to report the focus of his attention at the instant the stimulus was administered. Quite often a report of internally focussed attention accompanied by dream-like imagery was found to be associated with the presence of a mixture of low-frequency alpha waves and theta waves. The investigators followed up these initial observations with pilot EEG studies of three specially selected subjects, individuals who had practiced meditation on their own for many years. One was a professor of physics, another a psychiatrist, the third a psychologist. Each of these subjects was found to generate during meditation unusually high percentages of brain waves in the 6-9 cps range, and two produced long trains of theta waves. Moreover, both of these subjects experienced dream-like images, which they said were common in their meditations.

What were these images like? They were different for each individual, of course, yet they shared certain characteristics. They were dream-like rather than dream; hypnogogic imagery that emerged full-blown, so to speak, without consciously being willed; vivid visions of people, scenes, objects, known and unfamiliar to the subject. And they were changeful, as if a very private showing of lantern-slides were being run through the theatre of the mind.

In any case, these observations led the investigators to consider an important possibility: using autogenic feedback techniques, it should be possible to train a naive subject to bring the production of the AT brain rhythm under voluntary control, and thereby to elicit the imageful state in the laboratory where it might be studied in depth. It is this possibility which is the focus of the Menninger scientists most recent studies.

Although the researchers are able to use basically the same training procedures that proved effective in earlier work, training for voluntary control of AT frequencies presented them with some new problems to be solved. Chief among these was the fact that, as noted above, an individual producing such waves is semiconscious; consequently, a way had to be found to train a subject to become conscious, or aware, while remaining in the semiconscious reverie state. Only then would he be able to report what he was experiencing to the investigators. An example that illustrates the problem, and also foreshadows the eventual solution, can be drawn from the records of their reaction-time experiment. The subjects who reported that their attention was internally focussed and that they were experiencing dream-like imagery at the instant of the stimulus also acknowledged feeling quite drowsy. Many gave reports

indicating that, were it not for the stimulus they would not have become aware of these images. "One subject reported that the stimulus caused him to become suddenly aware of 'little pictures' in his mind that he did not know were there," Dr. Green said. "He described a 'void' into which the pictures 'popped' when the stimulus was given. Without the stimulus, he said, he would not have been able to remember what was in his mind."

As this example reveals, then, the researchers decided that a gentle stimulus would be needed at certain instants during training for AT control. The details, worked out in pilot experiments, are incorporated into the procedure to be used: "If the subject lapses into drowsiness or if he produces long trains of theta waves without reporting imagery, a chime sounds, drawing him back (or up, or down) into increased consciousness," Dr. Green explained. "This is accomplished mainly by automatic devices."

"One of the automatic devices used for enhancing awareness of normally unconscious imagery," he noted, "is an omnidirectional tilt detector—a mercury-switch finger ring. The ring is placed on a finger of the subject's dominant hand, which is continuously held up, balanced on the elbow so as to minimize muscle strain. From pilot work with the hand-balancing technique we have found that if the subject's attention or consciousness diminishes below a certain threshold level the forearm will begin to tilt. This closes the mercury-switch circuit and sounds a chime which brings the subject back to an above-threshold level of conscious attention in which he can report the imagery and the subjective states which preceded or were associated with the loss of balance."

In addition to introducing a stimulus into the training procedure, the investigators modified the visual feedback display panel so that a subject will train with two light-bar meters: percentage-of-alpha, and percentage-of-theta. The alpha-frequency circuit is arranged so that the bar fills with light as frequency decreases from 13 to 8 cps. They plan to use the auditory feedback system as well.

A formal study of training for control of AT brain-wave production will begin shortly. The subjects will be ten of the young college men who have already received training for voluntary control of muscle tension and alpha-wave generation. The researchers intend to combine laboratory training with home training in the study, the latter made possible by their development of a portable instrument for detecting and signaling the presence of alpha and theta waves by two different tones.

During the laboratory sessions, the EEG signal patterns that occur in association with reports of imagery will be categorized into such groupings as beta, alpha, theta, alpha/beta, alpha/theta,

beta/theta, flattened signal, etc. In like manner, the reports themselves will be grouped according to a standardized image-classification scheme. Then the two sets of classifications—imagery and EEG patterns—will be examined together to determine whether any consistent correlations occur. "In this way," Dr. Green noted, "we expect to find that some of the EEG categories will be described in existential terms which will give insight into the nature and content of the imagery associated with them." In other words, these investigators will begin to map the uncharted experiential territory of the mind.

IMPLICATIONS

The Menninger studies of internal awareness have a number of important implications. In education, for example, Dr. Green has noted that "much of the scholastic success of a student is a function of his ability to control and direct his attention, to concentrate his mental and emotional forces. These are skills that are accepted as necessary, and although it has been urged, they have not been taught in our schools, perhaps because they have seemed intangible and unteachable. In this research, subjects are trained to direct attention and control concentration in various ways. The development of systems of training in these techniques, suitable for transfer from the laboratory to the school, is a need and a possibility for the future."

The investigators' most recent work in training for AT production is relevant to the enhancement of creativity in children and adults alike. There are scores of anecdotes, as well as the findings of studies of creativity, indicating that truly innovative ideas are born not in the conscious mind, but in some level of mind where consciousness and unconsciousness overlap. This is the AT reverie state that the Menninger team is exploring; their studies in this area promise to yield new insights into the creative process, and to suggest practical methods for enhancing creativity.

These studies also have relevance for the science of human behavior, psychology. In Dr. Green's view, "psychology has long suffered, at least in the United States, from the exclusion of 'attention' and 'consciousness' because these words could not be operationally defined. Now it is hoped to help reinstate these once-abandoned concepts through the use of feedback techniques, and even more, help reintroduce volition into experimental psychology."

Finally, as noted in an earlier section of this report, the success of the researchers' work in training naive subjects in self-regulation of physiological processes bears revolutionary potential for

the field of psychosomatic medicine. On the basis of their findings, there is reason to postulate that in humans virtually every physiological process has psychophysiological ramifications and may become amenable to volitional control. Speculating about one specific application of physiological self-regulation, Dr. Green noted that the elimination of warts through hypnosis is possibly a function of local blood-flow diminution. "In appropriate situations," he concluded, "voluntary starvation and absorption of cancerous growth through blood-flow control might be found feasible. This would be a challenging area for research, and might lead to an understanding of some of the presently unknown factors responsible for spontaneous remission of malignancies."

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The Asymmetry of the Human Brain and Implications for Training

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Throughout our lives each of us is being trained in the way we use our nervous system, so that our sensory perceptions, our vision, the way we smell or hear or touch, as well as our mode of thinking, are finely tuned by the culture that surrounds us and by the people who directly influence our fate. We perceive selectively. We show habitual biases in our mode of thought. By adulthood our seemingly symmetrical brains are indeed very asymmetrical in the distribution of their functions. The giant cerebral hemispheres are quite specialized, and by adulthood our reliance upon the left or right hemisphere may be culturally biased. Dr. David Galin and Dr. Robert Ornstein have recently shown that normal adults tend to show relative activation in the left hemisphere when doing verbal problems and relative activation in the right hemisphere when presented with spatial tasks. The shift was observable in electroencephalographic recordings (EEGs) from the surface of the head, and corroborates clinical evidence that the left hemisphere tends to dominate during intellectual language activities, while the right hemisphere predominates during spatial, and what might be called intuitional kinds of thinking.

Most people in our technological society are rewarded for the kinds of mental activities that would be dominated by the left hemisphere, that is, analytic, verbal kinds of thinking. Artists, musicians, dancers, and children of the city ghettos, on the other hand, may be less skilled verbally but may be especially able to perceive relationships. Such people might be underrated on highly verbal tests of intelligence and may constitute a kind of "right hemisphere" culture. The work of Drs. Galin and Ornstein makes a preliminary step in asking whether individuals can be taught to

selectively suppress or activate either hemisphere, and whether special educational techniques can be designed to help people who have a difficult time learning verbal skills or individuals for whom left-hemisphere dominance is a hindrance, as it might be in learning music or sports. Since the interference of one hemisphere with the other may be responsible for difficulties in learning and functioning, the possibility of control suggests that it may be possible for people to learn to stop this interference of one hemisphere with the other.

Background

Almost everyone has some feeling for his own asymmetry. Most people are right handed, curiously enough, and have a difficult time learning to write with the left hand. Extremely verbal people, moreover, often find themselves trying to acquire non-verbal skills by telling themselves in words how to swing a golf club or dance or balance on skates. Much to their own chagrin their verbal adroitness is no help in learning motor movements. Moreover, athletic instructors often grow impatient with trying to state patterns of motions in words, and tend to demonstrate the movements. Suddenly, the novice who is learning the sport comes to a point at which he has stopped trying to articulate everything to himself in words, and he finds himself kinesthetically imitating the movement. Words, he now sees, interfered with that "feeling" of the movement; and conversely, the muscular knowledge did not help the instructor to put it into language. If a verbal mode of thinking is most appropriate to learning mathematics or languages, it helps little in learning to move through space, to sing, or stand on one's hands.

Since the early 18th century, it has been known that our cerebral hemisphere must be asymmetric in their specialization of functions. This was most clear in studies of people who had suffered from brain damage. People with lesions in specific regions of the left hemisphere showed problems with verbal memory, or speech deficits. If lesions occurred in certain regions of the left hemisphere, the individual no longer read fluently, while lesions in other areas left the person unable to do the simplest arithmetic. Damage in certain regions of the right hemisphere caused a loss of tonal or musical memory, so that damage in the left hemisphere led to losing the words of the song, while damage on the right would incur loss of the melody. Right hemisphere damage also led to an inability to recognize faces, or unfamiliar shapes, and to a loss of visual imagery that caused patients to state that they no longer experienced dreams. In sum, the clinical data suggest that speech, reading, language, and mathematical abilities require the

activity of the left hemisphere, while the right hemisphere predominates in spatial orientation, recognition of shapes and relations, in tonal memory, and Gestalt thinking.

The experimental program of Drs. Galin and Ornstein was, in good part, inspired by the earlier works of Drs. Roger Sperry, Michael Gazzaniga and Joseph Bogen, who had studied severe epileptic patients after split-brain surgery. This operation, which followed a long series of animal studies, has been performed on people whose crippling seizures would begin at one locus in the brain and sweep across to the other hemisphere through the nerve fibers of the corpus callosum. The two hemispheres are connected by this great bundle of nerve fibers which appear to integrate the functions of our left and right brains.

In many studies of cats, monkeys, and human beings after split-brain operations, Dr. Sperry and his associates saw that the human brain was less symmetrical than the brains of lower animals. In studying both animals and human beings, they used special devices that could present a task solely to one side of the brain. This is possible because we are, so to speak, cross-wired, and the right hand is primarily in touch with the left hemisphere, while the left hand and the left visual field communicate with the right hemisphere. After split-brain surgery, as Drs. Bogen and Sperry discovered, the hemispheres functioned independently. Learning and memory could be established separately in each hemisphere, and the person literally could not say what his left hand was doing. After split-brain surgery, it was particularly clear that the left hemisphere dominates in speech, writing, and mathematical calculations. The right hemisphere, by contrast, had only a few words at its disposal and could solve only the simplest arithmetic problems, although it easily solved tasks that required spatial juxtapositions, tactile identification, or musical memory. This kind of non-verbal material is recalled better by a normal person if it is presented to the left ear, but verbal material is more easily remembered if presented to the right ear. A compilation of studies on people with brain injury, epilepsy, people who had undergone split-brain surgery, as well as studies of normal people, all attest to the specialization of the two hemispheres and to an apposition of intellectual-analytic processes with intuitive processes. Ordinarily, Dr. Galin conjectures, we alternate between these modes of action rather than integrate them. This alternation can be exemplified by asking a person to describe a spiral staircase. He may make a noble attempt in words but usually will end up with hand gestures. Similarly, if you ask someone to describe the tango, he may begin speaking but will end up dancing the step.

Over a three-year period, Drs. Galin and Ornstein have asked

themselves what signs of hemispheric alternation might be read from surface EEGs. They ultimately evolved a possible discriminator: when the left hemisphere predominates, one might expect to see relative increases in activation in that hemisphere in the form of relatively more irregular, fast, low voltage brain waves and relatively less alpha rhythms. Meanwhile, the unengaged right hemisphere ought to show a relative increase in EEG voltage, with slower waves resembling alpha rhythms (8-13 cycles per second) in increasing amplitude.

Pilot Studies of EEG Asymmetry During Task Performance

In preliminary studies with normal volunteers, the investigators collected a number of tests that had been used to diagnose brain damage in either one or the other hemisphere. EEGs were recorded while volunteers completed these tasks.

To engage the left hemisphere, subjects were asked to write or mentally compose a letter, to do serial arithmetic, to read a narrow column of print, to make up a list of verbs beginning with the same letter, and to complete sentences. In order to encourage right hemisphere activity, they were asked to take four-colored blocks and imitate designs (Koh's blocks), to do mirror drawings, to assemble a sectioned picture, to look at drawings in which figure-and-ground are reversible, to perform the Seashore Tonal Memory Test of musical ability, to sort grades of sandpaper entirely by touch, and to do spatial constructions mentally.

Temporal and parietal electrode locations were the functionally appropriate ones to use. Although temporal leads present a problem, since they are especially vulnerable to artifacts from eye blinks, eye movements, and other muscle movements, they were the suitable loci (rather than the more commonly used occipital locations that more readily represent the visual system); and the researchers made many accommodations so that they could exclude all possible artifacts from their data.

Measures of Hemisphere Activation

As the volunteers performed their tasks, the EEGs were integrated from each location so that the resulting figure was an average of the voltage (or power) output of each electrode. This yielded an easily quantified record. Frequently, the differential effects of the right or left hemisphere could be discerned by eye in the raw EEG records. The subjects spent three minutes on each task and moved briskly from task to task. The ratios of EEG power on the right versus left hemisphere were computed for each task. Generally, the left hemisphere did put out less "power" dur-

ing language tasks and the right hemisphere showed relatively less amplitude during spatial tests.

Formal Replication of the Study

Since the pilot study confirmed the expectation of a measurable asymmetry during special kinds of tasks, a formal study was conducted with five men and five women. All were normal people with no history of left-handedness in their families, so all were right-handed with little possibility of mixed language localization. They were also "left hemisphere" types in the sense that all of them were researchers or research assistants functioning in a primarily verbal world. At the outset, to filter out the effects of eye movements, each volunteer was put through a series of eye maneuvers. Then his EEGs were recorded while he was seated with his eyes open, concentrating on his breathing in the manner of certain Yoga meditation exercises. He was told to fix his mind on the passage of air in and out, and not to let his mind wander. This gave some indication of the base-line EEG asymmetry when he was not doing anything in particular.

After the base-line recordings the subjects did each of the tasks both physically and mentally, permitting the experimenters to edit out artifacts due to eye movements, muscle tension, and blinks. A number of records were so contaminated by muscle artifact that they had to be abandoned, but the final results of the study showed that when a person solved verbal tasks the right (or resting) hemisphere evidenced reduced activity in an increased amplitude EEG output, a power that exceeded the EEG power from that hemisphere when it was engaged, that is, when the person performed non-verbal tasks. When the person matched block designs, conversely, the right hemisphere showed activation, and now the EEG relative power increases appeared in the left hemisphere. The researchers postulated that slow waves in the less engaged hemisphere might mean that the person's mode of activity was not suffering interference from irrelevant kinds of brain activity from the other hemisphere.

Dr. Sperry and his associates have indicated that either side of the brain operates best if the other side is "turned off," and Sperry has conjectured that the major function of the corpus callosum, that huge bundle of nerve fibers connecting the two hemispheres, may be to switch different systems off and on. Perhaps one hemisphere must "idle" somewhat to allow the other hemisphere full function, otherwise inappropriate modes of thinking might intrude upon each other. Consider the highly articulate person who cannot play a game, dance, listen to music, without trying to verbalize everything, sustaining an endless conversation in his head.

Perhaps, as Dr. Bogen has conjectured, human creativity represents an ideal integration of the two hemispheres and their distinctive cognitive systems. If the right hemisphere seems to reason by analogy, finding Gestalt solutions, intuitive patterns, then the left hemisphere is deductive, analytical, and critical. Inspiration may require the Gestalt solution of the right hemisphere to be transferred to the left side for analysis and critical appraisal. Balance may not be easy. Indeed, the educated Westerner often finds that in a conflict between intuitive and rational modes of thinking the left hemisphere all too readily gains ascendancy.

Our experience of the world is highly colored by the mode of thinking we prefer. Some individuals define everything in terms of context (c.f., Rosalie Cohen). Such a person would speak metaphorically, and if asked to give a synonym for money, might say lettuce or bread—things that money can buy. This metaphorical, "right brain kind of language," is beginning to pervade colloquial English, much of it springing from the street speech of city ghettos. Individuals who emphasize an analytic mode of thinking would define items by their boundaries and might feel that words had fixed meanings. To such a person the synonym of money might be "currency" or "coin." It has been postulated that children of poor people living in city ghettos tend to think in Gestalt, rather than analytic terms, and therefore do badly on conventional tests of intelligence. Moreover, since they lack training in verbal skills, and may "lead" with their right hemisphere, many of them may need special help to learn the verbal techniques that are taken for granted in the dominant white culture.

Further studies may indicate whether non-verbal professionals such as dancers, artists, and musicians perform differently on intelligence tests with different EEG results than the scientific researchers used as subjects in these experiments. Drs. Galin and Ornstein, in their next stage of their research, hope to use feedback techniques in order to train individuals to inhibit or accentuate the activity of a particular hemisphere and perhaps even a particular brain quadrant at will. If it is possible to learn the feeling of activating or suppressing a hemisphere, people may be taught to enhance their own learning abilities. There is reason to be hopeful about the efficacy of biofeedback, since other researchers have succeeded in using the method to train people to manipulate the percentage of alpha in the right hemisphere while leaving the left hemisphere almost constant (c.f., Peper) and to manipulate the phase relationships of the EEGs from the two hemispheres (L. Fehmi). Although most of this work is still unpublished, it indicates that biofeedback may enable people to selec-

tively control different quadrants of their brain. The possible applications of such control are innumerable.

It may some day become possible to teach epileptic people the feeling of an oncoming seizure and the ability to suppress it at its locus, and to teach people with other brain disorders—such as uncontrolled rage, stupor, seizures of slow waves—to similarly detect the oncoming symptoms and control the region of the brain in which they arise. Using teaching material that is contingent upon the person's EEGs, it may be possible to efficiently teach children with severe learning difficulties. Moreover, if it is possible to train people to use the right and left hemisphere selectively, individuals may begin to discover the qualities of various kinds of conscious states—for the mode and quality of our consciousness at any moment is related to the regions of the brain we are using. Most of us do not reflect on the manner of our thought, nor the operation of the machine that underlies our mind. The many advantages of an asymmetrical brain may become more apparent once individuals can manipulate the activity of their hemispheres by choice, as they choose to move a hand or to pay attention. Perhaps one of the most useful manipulations that people could learn would be to suppress the activity of the inappropriate hemisphere, thus preventing the right brain from butting in on left brain tasks, and vice versa.

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Learning To Control Brain Functions Through Biological Feedback Techniques

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Ironically, Western man has needed sophisticated polygraph instruments to give him access to himself. Unlike the yogic masters who have developed empirical disciplines to control their bodies and minds, Western people have so externalized education and medicine in their attempt to manipulate the environment, that they are out of contact with themselves. Most of us are uneasy within our own skins. We have learned to be afraid of our physiology and of the mysterious jelly-like computer in our heads. When in trouble we have learned to passively accept external help in such form as drugs, and never to meddle in the governance of our own survival. However, a revolution in self-concept is occurring, due, in part, to a small handful of American scientists who have been using laboratory instruments to enable men and animals to sense formerly unsensed states, and to control physiological functions that have long been thought involuntary.

Most people still feel that experiences such as seizures, chronic insomnia, rapid changes in blood pressure, general nervousness are all, in different ways, involuntary, inaccessible to the individual's will. Yet by instrumental conditioning, or biofeedback, humans and animals have learned to summon up and sustain particular brain-wave patterns, to control gastric secretions, blood pressure, even to fire single nerve fibers one at a time. Dr. M. B. Sterman and his associates at the Sepulveda VA Hospital and UCLA have gone further. After training animals to produce certain brain waves, they have begun to trace the neural regions involved and to study the aftereffects on behavior. They have seen intimations that this new kind of instrumental training might be used to profoundly alter the quality of sleep, or responses to drugs, even perhaps to modify temperament. Will epileptics one day learn to control the foci of seizures, and will tense youngsters

be taught to become relaxed adults? Ten years ago these questions would have sounded far-fetched but today they sound more like the promise of future medicine.

Life is a continuous, if random, education in which our nerves and flesh program responses to surprise, to anxiety, to delight, to all situations. The habitual manner in which the physiology reacts to stress may result in psychosomatic illnesses, for until now we have had no way to communicate with an individual about "unconscious" habits of capillary constriction, or gastric secretion, or muscle tension. However, an individual wearing electrodes, and hooked up to a receiver-amplifier known as a polygraph can be signaled each time he reduces his heart rate or tenses his forehead muscle, or when his brain emits an alpha rhythm (an even wave of about 60 microvolts in amplitude, and 9-13 cycles per second [cps]). Feedback can inform him each time he emits this rhythm, so that he can begin to identify the seamless, qualitative mental change that accompanies the signal. Instrumental conditioning is similar. An animal's brain waves may pass through a filter which activates a switch after it receives certain configurations and automatically opens a food hopper, rewarding the animal for that brain wave. Biofeedback and instrumental conditioning enable an individual to sense and control a formerly unknown internal state, to which we have had no access without instruments.

The Sensorimotor Rhythm

These techniques, as Dr. Sterman and his associates have shown, offer a means of assisting the individual, and also can be used to locate the brain regions associated with particular brain waves and the concomitant behavior. Dr. Sterman had been studying the neural mechanisms underlying sleep in cats. During deep quiet sleep, both the human and cat EEG show a synchronized, high-amplitude, recurrent brain wave called the sleep spindle-burst. Activity resembling this relatively slow burst of activity (12-16 cps) was occasionally observed during waking, and appeared to be generated by the outer portion of the brain known as the cortex—from regions involved in sensory perception, and in the regulation of motor behavior. It was given the name "sensorimotor rhythm" (a train of 12-16 cps activity from that part of the brain).

Could one condition a cat to produce this EEG rhythm? Equipment was designed so that it was possible for a cat's brain waves to pass through a filter which would operate an automatic feeder when the "right" waves appeared. A cat with electrodes placed on this brain area was hooked up so that the shifts of electrical polarity in several parts of the brain went through an electroence-

phalograph, or EEG machine, where the changes in polarity were written out as brain waves. This machine would filter for certain wave forms. In other words, when the EEG filter received a certain frequency of change and a certain voltage from the cat's brain, it would activate a switch that opened the gate to a feeder. In this way the brain "waves" of the cat dictated whether or not the animal would get a food reward.

These cats were kept hungry and rewarded with milk each time their brains emitted the spindling rhythm. It was soon clear that the rhythm could be encouraged. After 20 sessions in the training cage, the cats were emitting the rhythm far more frequently than they had at first. Now they were put through "extinction" in which the brain wave no longer was rewarded. After a few days, they were rewarded for emitting a different brain wave—the fast, irregular, low voltage waves that are often seen in wakeful, alert states. This learning was also extinguished by withholding reward. After a short respite, the cats were again rewarded for emitting spindles. These procedures made it clear that brain waves, like any other behavior, might be conditioned. When rewarded, the sensorimotor rhythm increased, and it diminished when extinguished. Indeed, when the experimenters instituted a progressive delay between the emission of the EEG pattern and the opening of the feeder gate, delaying the milk reward, they observed that the cat while waiting for its reward would continuously emit the slow, synchronized, sensorimotor rhythm.

Behavior

Each animal took a characteristic posture. When emitting this rhythm they were motionless, appearing to freeze in a curious position. During training, their previously random motions, walking around the cage, sitting, exploring, were replaced by a stylized and rhythmic alternation between drinking milk and posturing. Motionless, one cat would look straight ahead, its back arched. Another stood at attention before the feeder, another remained half crouching. Observation suggested that the sensorimotor rhythm was accompanied by a decrease in muscle activity and by shallow restricted breathing. Thus, when rewarded for the sensorimotor rhythm, the cats became motionless. However, when they were conditioned to produce desynchronized EEGs (an EEG pattern opposite to the sensorimotor rhythm), the same animals became restless, paced the cage, circling and searching. The EEG states were evidently susceptible to conditioning and also had an impact on the animal's behavior.

The shallow regular breathing of the cats as they produced the sensorimotor rhythm, and their unusual lack of muscle twitches or

bursts of muscle activity, suggested that the rhythm might involve the inhibition of certain motor activity.

Sleep

During sleep, particularly when the body musculature relaxes, there is an overall relaxation in the tonus of muscles and there is less body movement. During some portions of sleep, however, there are sudden twitches and a cat's whiskers will vibrate, its paws stab at the air as if it were briefly shocked by its own brain. Like humans and other mammals, cats sleep in a decipherable rhythm. In cycles of about 30 minutes, they move from a fast desynchronized low-voltage EEG, to slow, synchronous, large EEGs, and into a desynchronized EEG state of rapid-eye-movement twitches, and irregular breathing.

During quiet sleep, the animal's brain-wave patterns become slower, synchronized, and of higher amplitude. There are many spindles, punctuated by movements of the body, after which the animal may enter a drowsy or waking state, then drifting back to an epoch of quiet sleep. Usually the cat will awaken after shifting into sleep with desynchronized brain waves (similar to walking), irregular breathing, twitching, and rapid-eye-movements, an active, perhaps dreaming phase. During their quiescent slow-wave sleep they can sleep crouching, and clearly retain some muscle tension. However, when they move into periods of rapid-eye-movement sleep they cannot support their heads, and flop into positions as limp as cloth. Paradoxically, in this flaccid-state they show sporadic twitches that may awaken them.

Close examination of many sleep records showed Dr. Sterman and his associates that spindles did not occur during moments of phasic muscle activity and twitching, and never when there were eye movements. Indeed, when the animals emitted the EEG pattern in their sleep, they were still, and their respiration even seemed suppressed, very shallow and regular. It is when muscle movement dies down that the characteristic spindle pattern of sleep appears.

In later studies of eating behavior, cats showed the sensorimotor rhythm when they were waiting for a signal that would let them press a lever for food. Moreover, when a hungry animal was undergoing extinction, and gazed at the unrewarding lever in apparent frustration, or turned its back, the sensorimotor rhythm appeared again in long bursts. The sensorimotor rhythm appeared to be the EEG correlate of active inhibition within the central nervous system. The strange, rigid postures of the cats during their instrumental conditioning made it clear that they were not suppressing the kind of tonic motor behavior which allows one to

sustain a given posture more or less unconsciously. Instead, they were controlling and suppressing all those bursts of muscle activity that occur, like sudden eye movements. So it seemed that the inhibition of phasic motor activity was correlated with increasing the sensorimotor rhythm from the brain. Thus it was related to the control of movement.

Dr. Sterman and his associates trained a few cats to maintain the sensorimotor rhythm, while other cats were trained to produce a desynchronized low-voltage fast rhythm, like that of waking. Sleep records were now carefully examined. Before training, and again two months later, the experimenters examined the sleep of the cats who had been trained to enhance the sensorimotor rhythm. Their sleep was notably changed, and was different from the sleep of control animals. They showed more spindle activity in sleep, and their sleep was unusually quiet and peaceful and less broken than the sleep of other cats. They also showed fewer of the phasic, muscle twitches that occur during sleep. Perhaps it is this phasic activity that interrupts the sleep cycle and causes awakening. Training to effectively inhibit such activity may explain why these cats were having longer epochs of sleep without awakening. Moreover, the impact of training on their sleep persisted long after the training had stopped. A month later their sleep records still showed detectable increases in spindling. Behavior (in controlling the sensorimotor rhythms), indeed, seemed to change the central nervous system to a degree that could be detected in the EEGs, and the training of the sensorimotor rhythm had effectively improved the animal's sleep.

Neural Substrates

The sensorimotor rhythm, which is accompanied by an inhibition of muscle bursts, is also correlated with a slower heart rate. Thus, it may have implications throughout the autonomic nervous system. The spindling EEG phenomena of both waking and sleep appear to have a consistent function, suggesting a common neural mechanism. Information from records throughout the brain and from animals in whom certain brain regions had been ablated by lesions began to give a picture of the neural mechanisms.

Recordings made from different regions of the brain showed that the sensorimotor rhythm was restricted to the convolution at the surface of the brain, known as the post-central gyrus. This is a small region of the cortex located at the crown of the head. Each region of the brain's surface, the cortex, is connected with the thalamus deep in the lower brain and with the peripheral nerves of the body. Information about heat, cold, muscle movement passes through the thalamus as written material might pass through an editorial office on its way to print. A region of the thalamus

(ventrobasal complex) showed activity when the waking cat exhibited his sensorimotor rhythm, but this disappeared when the rhythm progressed to the spindles of quiet sleep. However, when the cat entered his cycle of active, desynchronized sleep, the thalamic activity and spindle activity again occurred together. Other brain regions, known as the VL nucleus of the thalamus, and the internal capsule and cerebral peduncle, deep in the lower brain, discharged whenever the sensorimotor rhythm appeared during quiet sleep.

During sleep spindle burst or waking sensorimotor rhythm activity, otherwise active nerve cells in the cerebellum show little activity. The cerebellum, knotted at the back of the brain, appears to govern movement, and is important in modifying and inhibiting movements. Nearby, a nucleus known as the red nucleus helps to integrate motor activity. Whenever an animal or person takes a step, or reaches for an object, a constant stream of information must be processed to tell the foot where the floor is, and to inform the hand of the location of the object. Information from the body must reach the brain. At the same time the thalamus is very active, sending messages to the motor cortex. The return instructions from the motor cortex and cerebellum project down an extensive nerve fiber tract (known as the pyramidal tract) to the spinal cord and fan out into the body and limb muscles. These fibers bear the messages permitting voluntary movement. The cerebellum appears to monitor movement and integrate the extension of the foot, for instance, with the information about the location of the floor. A person with cerebellar damage will often show tremors of intent when he wants to reach for something or is about to make a movement.

Dr. Sterman and his associates began recording from single cells in the thalamus, cerebellum, and red nucleus. Some cells in the thalamus seemed to give off rhythmic bursts, as if they were acting as a pacemaker. When these cells fired a great deal, cerebellar pacemaker cells were also firing and cells in the red nucleus would stop activity. The spindles of quiet sleep, and the waking sensorimotor rhythm seem to occur at a time when the feedback of muscle movement and sensory information has ceased, a state in which we do not need continuous information. Dr. Sterman has postulated that in these brief periods when there is no need for information exchange between the motor cortex, cerebellum, and thalamus, a slow oscillation develops between these regions which is responsible for the appearance of the sensorimotor rhythm and sleep spindles. The laboratory is continuing to explore the neural networks involved in EEG rhythms. This will allow them to know what regions of the brain they are influencing when they condition

an animal or person to enhance a particular pattern. Such knowledge might permit them to influence a deep brain locus—without surgery.

Dr. Sterman and his associates found that cats could be conditioned to produce and enhance the sensorimotor rhythm on only one side of the brain. Later, the sleep records showed that spindles were enhanced on the trained side of the brain, but appeared in normal amounts on the untrained side. Thus training, even on one side of the brain during waking, influenced that hemisphere during sleep. Could this mean that instrumental training—or auto-regulation in man—might be used instead of the scalpel? Could one train an epileptic patient to control the bursts of phasic activity that constitute seizures? Could one train an individual to control phasic activity on one side of the brain so as to prevent convulsions? Preliminary evidence from cat studies suggests that the potential is unlimited.

Two groups of cats were exposed to a very poisonous drug (monomethylhydrazine) that produces a sequence of symptoms ending in convulsions. This compound is used in rocket fuels and has posed severe danger to workers who might be exposed to it. Ordinarily the drug would produce restlessness, vomiting, crying, seizures, and finally convulsions. One group of cats tested with this drug had received instrumental training in the sensorimotor rhythm three months earlier. These cats were given the same doses of the drug as untrained animals. The untrained animals had seizures within an hour, but the previously trained cats went through a long delay, and often did not suffer convulsions, although they showed the restlessness, vomiting, and precursor symptoms. It was interesting to watch these animals. Although they had been trained long before, they seemed to be controlling the seizures in their brains by adopting odd motionless postures, often staring off into space, or gazing at an inert, lifted paw. They had apparently learned how to inhibit motor activity, and thus delay or even prevent the motor symptoms, convulsions, of this extremely toxic drug. The brain-wave training that was associated with motor control did, in fact, affect brain functions and thus response to drugs. This dramatic example indicated that individuals might learn to control certain brain activities, thereby controlling their normal functions and their reactions to drugs.

The drug studies gave further evidence that the nervous system is extremely plastic, and that we might use conditioning to accomplish very specific functions—as we now use surgery or drugs. An individual who was trained to produce a particular rhythm in a particular region of the brain might indeed alter the activity of

that region permanently. If begun early in life, could the conditioning permanently change brain structures?

The sensorimotor rhythm first appears when a kitten is approximately two weeks old. It can be conditioned in a three-week-old kitten. Further studies will indicate whether instrumental conditioning during infancy can improve sleep throughout life, producing resistance to seizures, and perhaps improving the temperament of the animal. Will these kittens grow up to be better cats? Will they learn more adaptive behavior when they're under stress? Can they learn to control their motor behavior better than untrained kittens? Will they sleep more deeply and soundly?

The sensorimotor rhythm is also being conditioned in adult animals, who will not have to use motor suppression. When the cats emit the rhythm, a filter switch gives them a reward—not of milk but of direct electrical stimulation to a region of the brain that produces a sensation of pleasure. This so-called pleasure center was found several years ago by Drs. James Olds and Peter Milner, who saw that rats preferred to give themselves electrical impulses in this region of the brain rather than receive any external reward that could be offered them. By using self-stimulation, the instrumental training occurs entirely in the cat's brain, and he never has to move. The cat can be paralyzed with a drug such as flaxadil, and now the conditioning is demonstrably "mental," and not contaminated by muscle movement. While these cats are being conditioned, cellular changes are being sought by examination under powerful electron microscopes. Dr. Sterman and his associates are looking for structural and chemical changes in specific brain cells. Indeed, the laboratory should soon know whether it is possible to teach an animal to activate or suppress specific single brain cells in the basal forebrain. Since human beings have learned to control the firing of single nerve fibers in their fingers, suggesting control over single neurons in the motor cortex, it seems likely that animals can learn to control specific neurons by instrumental training. Such training might provide another step toward such applications as helping epileptics to control their seizures by suppressing bursts of activity in damaged cells.

In current experiments, being carried out in collaboration with Dr. Mathew Buttiglieri and others in the Psychology Service at the VA Hospital, staff volunteers are being trained to produce the sensorimotor rhythm. These individuals have been wearing surface electrodes around the skull, and are wired up to an EEG machine with a filter that is set for the sensorimotor rhythm. Each subject is instructed to make a bank of lights turn on, by purely mental effort. Adult human beings show almost no sensorimotor rhythm when they first enter the experiment, but soon they

emit the rhythm. They see a bank of lights go on, in the manner of a pinball machine, and when they have produced a long train of waves so that the rhythm satisfies a criterion, they are informed by lights and a bell. When asked how they produce the rhythm, they answer, typically, "I'm tracing a star very carefully on a wall," or "I'm mentally doing a pursuit rotor task." Although this work is still in the pilot stage, it suggests that a revolution may soon occur in man's use of his own brain.

Today, indeed, the conditioning of these synchronized brain waves is permitting a new kind of exploration of the untrained brain and how we might employ it more effectively. The possible applications are unlimited. Further studies of epileptics may indicate whether it is possible to condition the control of foci that cause seizures. Similarly, studies of schizophrenic patients may indicate that they, too, can suppress the distractions that seem to invade their attention if they learn to suppress activity in specific brain regions. Certainly insomniacs, and others with sleep problems, may be taught the neural control that will improve their sleep. In the future, voluntary control and the conditioning of specific brain structures may replace some surgery and drugs. It may, in addition, accomplish changes that are not effectively produced by psychiatry, such as improving the basic temperament of person. Studies involving another brain-wave pattern suggest that the ability to enjoy life might be enhanced by instrumental training.

Post Reinforcement Rhythm

This EEG rhythm, which has been noted when a cat eats, drinks, grooms, or relaxes, is a high voltage slow synchronized pattern from the cat's visual cortical area that is seen also during drowsiness. It was observed while cats were drinking milk rewards, and might be the analogue of an alpha rhythm in man. A number of researchers, beginning with Dr. Joe Kamiya, of the Langley Porter Neuropsychiatric Institute in San Francisco, have used feedback to train people to produce and sustain an alpha rhythm (a synchronized pattern of 9-13 cps in man). Many of the early subjects described the state as a pleasant, relaxed, floating state of consciousness. It has been recorded in Zen Buddhist masters during meditation, when it appears to be sustained for long periods. People who voluntarily manipulate their own alpha rhythm claim that it is a rewarding state.

Dr. Serman and his associates had noticed that their experimental cats emitted a synchronized wave pattern just after they received a milk reward. They called it a "post reinforcement synchronization"—or PRS. Using the same instrumental technique

they had used in training the sensorimotor rhythm, they now changed the filter so that it accepted only a 4-12 cps episode with high voltage. When the animal emitted this PRS rhythm the automatic feeder gave him some milk. Soon this activity occurred frequently. After an animal had produced a number of PRS emissions, he would begin to lie down between rewards, with signs of diminished interest in food. The PRS response was never evident in extremely hungry cats, but began to occur after an animal had been drinking milk and became somewhat satiated. One cat typically squatted next to the feeder, and would turn his head to drink the milk when it was presented, quickly looking away when he was finished. After a while he lowered his head to his paws, and closed his eyes when the feeder was operated. He appeared to have lost interest in the reward.

After a number of training sessions, cats would begin to emit the PRS pattern immediately when placed in the conditioning chamber. Although they might drink milk like any hungry cat while they were in their home cage, they no longer drank the milk they received as a reward in the training cage. This experimental cage apparently became a happy place for them. They would enter the cage and begin purring and kneading with their paws as cats often do when perfectly content. The experimenters had to pound on the side of the cage in order to get the cat to rise and drink his milk. Apparently the cat had learned to turn on a pleasure state that was self-fulfilling. Moreover, it seemed likely that this satisfying and restful state might be conditioned, leaving profound effects upon the sleep and the temperamental qualities of the animal.

A variety of studies have suggested that the neural mechanisms underlying this state might be extremely interesting: the synchronous waves of the PRS emanated from the posterior and medial cortex of a cat while it was drinking its milk, but the rest of the brain emitted desynchronized low-voltage patterns.

The PRS configuration resembled brain-wave rhythms that had been observed by Dr. Charles Sawyer during studies of rabbits following ejaculation, and seen by Dr. George Ling and his associates in cats just after they delivered kittens. A rhythm very similar to the PRS had been elicited by electrical stimulation to basal forebrain, a region that is important in generating sleep.

Experimental lesions were made in the basal forebrain in some cats, while in other animals lesions were made in the thalamus. The latter animals, with thalamic destruction, showed no decrease in their PRS activity and merely went on purring and producing the brain-wave pattern whenever placed in the experimental cage. The animals with forebrain lesions showed an increased, then a

decrease, and finally a gradual recovery of their PRS output. The experimenters postulated that this rhythm might constitute a very subtle and complicated mechanism of satiety, whose neural structures are as yet untracked.

Transforming Temperament

If studies of the sensorimotor rhythm raised some long-term questions about the possibility of altering the nervous system by training, the post reinforcement synchronization raised the possibility that profound changes might be made in the pleasurability of life for otherwise anhedonic and tense individuals. Because laboratory cats show all manner of individual differences, they comprise a population with diverse temperaments. Hyperactive, exceedingly active cats show less of the spontaneous sensorimotor rhythm and PRS. The animals who show least of these synchronized rhythms in waking are sometimes the most intractable, nasty animals. It is interesting that the bastards cats show neither EEG signs of a pleasure state, nor the inhibition of phasic motor behavior. In further studies, in which kittens will be conditioned in PRS and the sensorimotor rhythm, it may be possible to see whether a difficult animal can be transformed into a more relaxed and comfortable creature. Since verbal suggestion is impossible with cats, such a study would be a convincing inducement to try a similar transformation with man. If instrumental brain-wave conditioning can make an irritable cat into a relaxed cat, the chances of doing the same with man look promising indeed. Perhaps here, too, feedback training can accomplish what psychiatry often cannot: in a relatively short time it may be possible to train unhappy, neurotic individuals to generate pleasure and relaxation even without altering the substance of their discontent. They would be enhancing states of consciousness that mystic disciplines have encouraged for centuries, and perhaps programming into their brains a happier and permanent mode of response.

Quite a number of possible applications are on the agenda of the laboratory. Zen practitioners, who maintain alpha rhythms for long periods of meditation, claim to need little sleep, and experiments have been designed to determine whether conditioning the PRS rhythm will reduce a cat's need for sleep. In general, cats that are being conditioned, or have a task to perform, sleep less, but the basic rhythm of the sleep cycle is unchanged. A rhythmicity has been observed in conditioning. Cats produced the sensorimotor rhythm most frequently, in a rhythmic manner, suggesting that conditioning took hold most rapidly at the peak of the animal's rest-and-activity rhythm. If a similar rhythmicity influences man's trainability, one might expect cycles of peak vigilance to

occur with periods of 90-120 minutes, a round-the-clock rhythm that is continuous with the cycle of rapid-eye-movement periods during sleep.

One of the unique aspects of this program, in comparison with other researches on instrumental conditioning, is that animals are conditioned, and their neural substrates explored before the same techniques are applied to human volunteers. There are a number of advantages. Cats cannot be accused of responding to suggestion. Moreover, since it is possible to trace the neuroanatomical substrates of each EEG configuration, researchers have a more specific idea of the brain regions they are attempting to influence when they deal with human beings.

Applications

Already it seems likely that people with insomnia will benefit from feedback training in the coming decade. This form of therapy may, indeed, replace barbiturates and tranquilizers. Data on the sensorimotor rhythm clearly demonstrate how the use of one's mind, a repeated state of consciousness, even just a limited form of motor control, influences sleep for a long time thereafter. Cats that were trained to sustain this sensorimotor rhythm showed longer sleep epochs, and more quiet sleep, a month after conditioning. However, when cats were rewarded for maintaining a desynchronized rhythm characteristic of intent alertness, they were more restless, and their sleep epochs were shorter than those of the spindle generating cats. No mistaking the fact that habitual states of mind affect sleep. However, it now seems likely that a person who is agitated and sleepless may not have to change the content of his thoughts to become more relaxed; for without psychiatric treatment, he might learn to alter brain-wave rhythms toward a mode, or level of being, that is more relaxed. If such conditioning persists in man as it does in cats, perhaps childhood conditioning can produce permanent changes in the neurological structure.

A revolution in self-concept and self-treatment is at hand. As this research proposes, we may modify the brain without surgery or drugs, and produce emotional, temperamental changes without lengthy psychiatry. Beyond the imagining of the Eastern mystics, who follow a discipline based on empirical lore, Western man may soon have the ability to train and explore his brain in unprecedented detail. Experimental data can reveal precisely which parts of the brain function in the production of specific wave patterns. Thus, it should be possible to teach specific parts of the brain how to behave. Drs. Robert Ornstein and David Galen have suggested that individuals can differentially control brain waves (alpha

rhythms) in one or the other hemisphere and in limited regions from the front of the head to the back. This has been confirmed by at least one subject by the asymmetry training studies of Eri' Peper at the Perception Laboratory of the Bedford, Massachusetts, Veterans Administration Hospital. This work suggests that individuals can be trained to manipulate the background state of a particular quadrant of the brain. They might, for instance, learn to suppress activation in language areas of the brain when attempting to learn sports or spatial relations.

Training in internal functions is totally random at present. Life poses a continuous series of challenges to which the body reacts, developing habits of response in a haphazard fashion during infancy and childhood. These responses may become part of the structure of the brain. A nervous child who reacts to novelty with anxiety, and has trouble sleeping, is likely to become increasingly nervous as adolescence imposes further stresses upon his system. At present, nobody can really help this child, for his temperament is accepted as given and he is likely to be treated from outside, possibly with drugs rather than training. Children grow up without the least instruction in fundamentals of survival and health. Like the victims of a capricious god, they experience a range of moods, terrors, and exhaltations, the helpless recipient of multitudinous sensations of fatigue, tension, and pain, and they are never told that the nervous sytem that subjects them to all of this is their own instrument, and one they can learn to manipulate. At present, nobody can detect what a child is doing when he fails to learn, and nobody offers training in concentration. Neither schools nor parents communicate directly with children about internal states. Until the advent of biofeedback, it was not possible to sense a child's feelings through instruments, and teach him to "feel" differently at will. If it is possible for a cat to resist convulsions by brain-wave conditioning, it does not seem inconceivable that a human being can learn to turn on a state of calm, or of relaxation, so that it modifies the usual level of tension he experiences. Control over autonomic functions such as heart rate, blood pressure, and temperature is probably not far off. In the more distant future, conditioning may enable individuals to awaken and recall dreams, to utilize their memories, to evoke a range of fantasy and internal imagination that is now largely suppressed. Such a person may experience what few human beings have achieved—a sense of self-integrity and of mastery.

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The Use of Biofeedback Training In Enabling Patients To Control Autonomic Functions

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In the future specialists treating patients with a variety of psychosomatic diseases may have the option of using training instead of relying exclusively on drug therapies. Psychologists, working with physicians, particularly in the realm of cardiovascular illness, have shown that there are behavioral aspects to the etiology of illness, and similarly, behavior can be reshaped to modulate the symptoms. A new concept of the autonomic nervous system is emerging in Western medicine, for it is clear that both animals and man can exert fine control over aspects of organic function that had been thought to be involuntary. In some instances the investigators have been using instruments that would sense, amplify, and feed back to the subject an inner change such as blood pressure, or stomach acidity that he might not ordinarily be aware of, thus allowing him to recognize these physiological functions and to gain control over them. This technique has been known as biofeedback. Other researchers have not fed back the internal signal in a manner the subject could recognize, but instead have rewarded him for producing a certain kind of change, in the traditional manner of operant conditioning. The distinction between biofeedback and operant conditioning depends upon whether or not an individual is rewarded for the correct response.

Sometimes, however, the distinction is obscure, for a person with hypertension often will be rewarded merely by seeing that he has moved his blood pressure down. The important point is that the instruments that feed back internal changes to a person allow him to "see" his own physiological responses and then to control functions that formerly lay outside his awareness. In general, experimenters using animals employ operant conditioning, while many of the human experiments rely on feedback, thus the term biofeedback has become popular.

Psychosomatic Illness and Response Specificity

Among many people with the symptoms of hypertension, ulcers, or other psychosomatic illness, it is almost a commonplace that stress can activate symptoms. Articulate patients, for example, have described feeling restrained rage as "a knot in the stomach," or "bursting in the head." Over the last two decades quite a number of psychiatrists, psychologists, and clinicians in other specialties have conjectured that for various reasons individuals may react to stress in specific physiological ways. One person might brace himself, habitually, by tensing the muscles of his back and neck, while another might respond with the rapid breathing and cardiac changes that would be appropriate if he were preparing to fight. These changes throughout the nervous system, endocrine system, and musculature galvanize a person to meet a physical threat, but in the context of a purely intellectual challenge, such physiological changes might become a damaging habit.

In the early 1960's, Dr. Bernard T. Engel and his colleagues began to study healthy young people and patients with psychosomatic diseases to see whether they showed very specific tendencies when they responded to stressful or neutral events. Pulse rate, blood pressure, respiration, and skin temperature and resistance were measured in healthy young nurses under a number of conditions—while solving arithmetic problems very quickly, or immersing a foot in ice water, or being subjected to a loud automobile horn. The kinds of responses depended in part on the stimulus. However, each individual seemed to have his own manner of reacting physiologically to stressful stimuli. These individual propensities were not very clear in the healthy volunteers; however, patients with essential hypertension showed a marked tendency to respond with changes in systolic blood pressure.

A second study was designed to compare patients with hypertension and patients with rheumatoid arthritis. In this study, the stimuli were relatively mild, statements that demanded a free association response. Test phrases, such as "I am constantly pressured," were recited to the patients. The patients did not reveal

many differences in their reactions to the test phrases, but they did respond differently to the entire experimental situation, in which they were wired with sensors and given relaxation periods. These periods were exceedingly revealing. During the rests, the arthritic patients never adapted by relaxing the muscle groups spanning joints that had been giving them pain, and the hypertensive patients did not lower their blood pressure.

There is a voluminous literature on the subject of response specificity, but none of it gives data clear enough to predict which psychosomatic ills a particular person will develop, since genetic differences and the myriad of influences in an individual's lifetime make the etiology very complex. In some subtle fashion, however, it appears possible that a person's habitual responses to stress may ultimately lead to symptoms, or may influence the course of the disease whatever the cause.

Disponesis

Dr. George B. Whatmore and his colleagues in Seattle, Washington, have been using instrumental feedback to "retrain" many patients with symptoms such as headaches, backaches, depression, extrasystoles, and exhaustion. Dr. Whatmore has postulated that these people have come to react to environmental events, bodily sensations, thoughts, and emotions with specific but undetected covert expenditures of energy. This covert energy expenditure is not a vague entity. It consists of measurable action-potentials in the neuromuscular system with consequent covert muscular contraction and biochemical change. This "dysponesis" appears to have pronounced effects upon the autonomic nervous system and endocrine system. Bracing—holding the skeletal musculature partially contracted and thus the body rigid and on guard—can enhance a person's arousal and intensify a sense of fear and anxiety. It can also disturb the function of smooth muscle, thus disturbing digestion and can lead to ulcers, colitis, and other conditions. Since patients who are making such characteristic efforts do so unknowingly, it takes considerable training for them to recognize what they are doing. By amplifying, processing, and displaying in audiovisual forms the covert tensing and relaxing of various muscles, Dr. Whatmore has enabled patients to identify and control their covert efforts. Gradually they are trained to continue their control during conversations on stressful subjects. The patient is then encouraged to practice this control in daily life. It may require two years of training; however, follow-up studies have demonstrated that patients have overcome symptoms of backache, headache, or depression so severe that they formerly required hospital care. Dr. Whatmore's careful and cautious clinical work

over nearly two decades suggests that neurophysiologic retraining may reach some of the origins of symptoms, returning to the individual some responsibility and also ability to protect his own health. One might say that this returning of responsibility to the patient is now becoming a philosophical trend in medicine.

Feedback for Sensing Internal Changes

Many researchers are reaching toward a similar mode of therapy. Perhaps, ideally, we should begin to use all available techniques so that youngsters and young adults might learn to "tune in" to their inner sensations discovering how they respond to unpleasant events and how to control their responses. It is easy to show a child how to throw a ball, by demonstrating, and moving his arm. Ultimately, with feedback from his own action, the child's practice will make him accomplished. It is, however, difficult to tell a child how to control his bladder, or his intestines, or any internal processes. Most of us are relatively insensitive to small events in that interior hinterland of our bodies, and while we will put ointment on a burn, we may tolerate a developing duodenal ulcer for months without seeing a doctor.

Dr. Henry Slucki, a psychologist at the University of Southern California Medical School, has indicated that it may be a lack of interoceptive discrimination training that permits us to go through life so bluntly insensitive to events within our skins. Even animals in the laboratory take longer to learn a response that is attached to an internal stimulus than to respond to a light, or sound, external to the body.

If serious illness is to be prevented, individuals must begin to apprehend incipient symptoms at the earliest possible time. Today, most people go to the doctor too late, after they feel pain, or have seen a serious disruption in their own behavior, an inability to concentrate, or great fatigue. Because our culture encourages a kind of puritan fortitude, children, who often do anticipate their illnesses by responding to the gentle prodding within, are taught to ignore such feeling and may be accused of malingering because they do not yet have a fever. Could early diagnosis and preventive medicine be enhanced by reversing this attitude and training people to monitor events in their bodies?

A coworker of Dr. Slucki, Gyorgi Adams, found that when volunteers swallowed inflatable balloons, their brain waves, by desynchronizing, registered the fact that the balloon in the stomach had been inflated even when the individual did not report "feeling" anything. Moreover, volunteers quickly adjusted, or became habituated to the balloons, although they appear to learn spatial

discrimination when there were two balloons. The inflation of a second balloon also showed up in desynchronized brain waves, even though the individuals were not consciously aware of it and could not verbalize what was happening internally. In order to find out whether interoceptive training (training in internal sensitivity) would be possible without contamination from the effects of verbal suggestion or the emotional complexities of human beings, Dr. Slucki began working with animals.

In an initial study with Drs. Gyorgi Adam and Robert W. Portive, five macaque monkeys were implanted with an inflatable loop in the small intestine and with electrodes at sites in the brain. These animals quickly learned to press a lever rapidly for a sugar pellet. Much like the human volunteers, they seemed to go on pressing unperturbably even when the balloon was inflated, as though they didn't feel it. Occasionally one of them would look around. Generally, they seemed not to show any sign of noticing the internal stimulation, although their EEGs became desynchronized each time the balloon was slightly inflated. Thus, in some fashion, the cortex was receiving the internal news, although the animal acted unaware of stimulation. Then the monkeys were rewarded only for bar pressing when the balloon was inflated. As if they had learned to "feel" they quickly became adept at pressing the moment the balloon inflated. In a subsequent study, a similar procedure was performed using the colon, and the monkeys showed the same ability to respond to a formerly overlooked internal stimulus. Learning, indeed, did seem to increase their sensitivity. After they had learned to "feel" and respond to the sizeable inflation of a balloon, they became sensitive to a very tiny balloon inflation that they could not "sense" at first. Internal conditioning seems to proceed very much like any external training, in which an individual first learns to respond to gross properties, and later to more refined and delicate qualities. In psychology this is known as stimulus discrimination.

In a similar study with female monkeys, water at body temperature was infused through a catheter into the bladder, thus increasing pressure on the bladder, and the animals were conditioned to press a lever at each increase in bladder pressure. In this way the animals became aware when the bladder volume became high and they relaxed their bladder in order to reduce pressure. These studies might enable adults to make toilet training easier for children by giving them more explicit verbal instructions, relating pressure and urination. Sensitivity to pressure, to tension and relaxation throughout the intestinal system might indeed enable people to anticipate, perhaps even prevent themselves from incurring such symptoms as spastic colon, or colitis. This kind of training is

being used to enable both discrimination of internal events and control over many autonomic functions.

In quite a few laboratories, other researchers are using instrumental conditioning to find out to what extent that various functions of the body may be controlled by training. At Duke University, for instance, in Durham, North Carolina, Drs. Ben Feather and Malcolm Robinson have shown that animals can learn to control the output of bile in the spleen. Dr. Louis Vachon and his associates at Boston University have begun investigation to determine whether biofeedback training might elicit some voluntary control over the regulation of respiratory resistance which is the key symptom in asthma.

Asthma: Can Airway Resistance Be Modified?

Asthma is a widespread illness of unknown cause. The symptoms, which come in attacks of wheezing, coughing, shortness of breath and gasping, are usually reversible but attacks can be prolonged and even fatal. At these times the patient is struggling to get air to his lungs through the bronchial airway. This is the tree-like branching of tubes that starts with the trachea and subdivides many times into extremely fine bronchioli that carry air to the alveoli where oxygen and carbon dioxide are exchanged in the blood. Normally the airways offer little resistance to the flow of air; but in asthma this resistance can so increase that the alveoli receive almost no air. This happens because, during an attack, the mucous lining of the bronchi becomes thick with fluid. Moreover, there is a secretion of very thick, viscous mucous that blocks the small tubes, and spastic contractions of the smooth muscles practically close down the passageways of the bronchioli.

It is widely accepted that such a reaction is triggered by some allergic mechanism, in which histamine and probably other substances are released. However, many attacks are not triggered by allergens, but by shocks of cold air, or emotional factors. Patients whose asthma was believed by them to be caused by flowers have been known to go into an attack after they were shown a paper flower—perhaps indicating autonomic conditioning. However, such attacks may have involved no more than the voluntary muscles of the throat, chest, and abdomen. If attacks could be triggered by a conditioned stimulus—might there indeed be some autonomic conditioning of smooth muscle contractions in asthma? Dr. Louis Vachon, working with Dr. Peter H. Knapp (and with some discussion with Dr. Gordon Globus) began to explore the possibility of using biofeedback to illuminate this question.

When the program began in 1967, the major problem was one of technology. It was difficult to devise an instrument that would give

a continuous and immediate index of air resistance without requiring the individual to make special breathing maneuvers. Fortunately, at that time the needed instrument was being developed by Bob Goldman in Dr. Jere Mead's laboratory at the Harvard School of Public Health. It pulsates the air which is breathed by the individual through a tube. Careful measurements of the pressure and flow-wave engendered by the pulses make it possible to derive the total resistance to air flow into the lungs. Dr. Vachon has linked this instrument to a small computer which monitors each pulse for respiratory resistance, and which can be programmed to give immediate feedback—illuminating lights in front of the person, who breathes through the instrument.

After establishing the safety of the instrument for the individual using it, Dr. Vachon has begun studying a group of people with asthma that is mild enough for them to forego medication for at least 24 hours on days of laboratory sessions. These patients are being treated as research volunteers, and are not aware of the purpose of the experiment. The very preliminary results are encouraging. Some patients have learned to respond to the feedback lights in order to reduce their respiratory resistance. Although they couldn't seem to describe what they were doing when they were successful, a few subjects remarked that they seemed to do better if they didn't try too hard. Of course, the laboratory situation is different from real life, and it remains to be seen whether people can be trained to lower air resistance when they are away from the immediate feedback. If so, it may be possible to see whether the conditioning of the autonomic nervous system plays a role in producing the asthma symptoms in the first place.

The functions of the autonomic nervous system in many parts of the body no longer appear to be so involuntary as we once believed. It is particularly in the realm of cardiovascular function that a convergence of studies begins to indicate that many aspects of heart function may be voluntarily controlled, thus opening many new possibilities for therapy. Many people first became aware of this work through the articles of Dr. Neal Miller, of Rockefeller University, and Dr. Leo DiCara of Yale, now of the University of Michigan. Unequivocally, they had shown that curarized animals could learn to slow or speed heart rate through presumably "mental" means. This body of work should be treated separately and is therefore excluded here. In point of fact, many people already had been centering on voluntary control of the heart from different disciplines and different directions.

Conditioned Control of the Heart

Dr. Bernard T. Engel, who is now at the Gerontology Research

Center (NICHD) of the Baltimore City Hospitals, has chosen to work with cardiovascular patients throughout his career as a psychologist. Dr. Engel began attempting to condition heart function in the early 1960's. He had spent nine years at the Cardiovascular Research Institute at the University of California Medical School. In any medical environment, heart physiology is explored mainly from disembodied hearts in nutriment, or during "acute" (lethal) experimental operations, but the heart is almost never studied in conscious animals. Since he believed that the central nervous system exerted a significant influence on heart function and that this influence could affect the nature of the patient's symptoms, Dr. Engel wondered if individuals could be trained to counter their symptoms, to control their hearts.

In 1963, a high school boy came into the laboratory and Dr. Engel wired him to an oscilloscope, and began to reward him for raising his pulse rate, then for lowering it. Using ordinary training techniques, he found the student could raise or lower pulse rate, and raise or lower blood pressure.

Later, a 41-year-old man from the Haight-Ashbury district of San Francisco came into the laboratory suffering from what is known as supraventricular tachycardia, a too-rapid-heart beat localized in one portion of the heart. By operant conditioning he learned to control his heart rate very dramatically. When Dr. Engel attempted to find out how he managed to exert such fine control, he said, "Man, you just sit there and pretty soon you start grooving." The man's confidence and mastery, like that of earlier subjects, suggested that others could learn heart-rate control, too. But what was the internal technique of control? Did it depend upon respiration or muscular controls, upon specific kinds of thoughts, or emotions? Was heart rate and other kinds of cardiac control potentially within the reach of everyone? In the subsequent years, Dr. Engel began a systematic program of experiments in which he conditioned many normal individuals and monkeys to control their pulse rate. The studies began in 1964-65.

Heart Rate Conditioning: Slowing the Pulse

The earliest, and most tentative, conditioning experiments were begun with fifteen healthy college men, of whom ten were given experimental conditioning, while five served as yoked controls. At the outset they were instructed to breathe normally lest abnormal respiration interfere with the measurements. The individual's pulse, relayed by a cardiometer to an amplifier, was used to trigger a light. At first the experimenters adjusted the trigger to the individual's resting or operant heart rate so that all he needed to do was to slow his pulse very slightly, and he would turn on the

light, indicating a "correct response." A clock accumulated the number of seconds during which the light was on, and the students were paid a half cent per "correct" second. In the initial two training sessions the students reaped easy rewards because the trigger was set for a relatively easily attained pulse rate level. In the next four sessions the trigger level was changed so that normal fluctuations of heart rate would keep the light on for only 50 percent of the time. At this point, half of the volunteers lowered their pulse rate still more, while half of them did not.

After the experiment each man was interviewed and asked what responses he believed controlled the light and what he had done to keep the light on. The answers began to reveal a strange paradox. One man who appeared to learn how to slow his pulse said that he had kept the light on by thinking of examinations on which he had done poorly and of quarrels with his wife. Ordinarily, one might have thought that such thoughts would raise, not lower, pulse rate. Some subjects had no idea: they concentrated on objects in the room or relaxed. Most perplexing of all, the four subjects who guessed that decreasing heart rate would keep the light on—were non-learners in the terms of the experiment. These men, who had guessed the true nature of the task, could not perform it, thus raising some interesting questions about the possible difference between recognition and control. The people who guessed the nature of the task had proceeded in a somewhat rational manner. They had tried to keep the light on by relaxing—the very technique that had succeeded for their less shrewd counterparts—but relaxation did not work for them, perhaps because they were trying too hard to slow their hearts rather than uncerebrally focusing on the light. Since the control subjects also did very poorly, it appeared that the conditioning technique had been effective, at least with a portion of the volunteers.

Increasing Heart Rate

When the experiment was repeated, the conditioning was set to encourage the pulse to accelerate. This time all of the experimental subjects seemed to learn, suggesting that it is easier to accelerate than decelerate the pulse. Again the subjective accounts after the experiment seemed paradoxical. The one individual who denied that he had been controlling the light had increased his heart rate more than most of the others. One man guessed that either heart rate, swallowing, or breathing controlled the light, and he increased his heart rate by relaxing. Others had no idea what they were doing. One subject decided that it was muscle tension that turned on the light and he sustained a state of tension and excitement.

Heart Rate and Respiration

In order to explore the possible relationship between heart rate and respiration rate, Dr. Engel and his associates now undertook a further study, this time with women subjects who were told to breathe in time with a metronome. During fast breathing the average heart rate increased in only one subject, decreased in another, and remained the same in four subjects. The finger pulse volume decreased during slow breathing in five of the women, increased in two, and did not change in one. The relationship between breathing, pulse, and finger pulse volume was not clear and simple, although a 25 percent change in the rate of breathing did seem to change the variability of the heart rate, the standard deviation from an operant level.

The evaluation of heart rate changes is, in itself, somewhat complicated since a person does not sustain a steady beat as even as a metronome, but rather varies, accelerating and decelerating around a level. A change in the pace of respiration would temporarily increase the amount of acceleration and deceleration, even though it would not change the average heartbeat rate counted over ten-minute periods. On the other hand, by breathing slowly, one could lower the amplitude of the pulse as measured in the finger, decreasing the volume of blood that comes into the finger tips with each heart beat.

Alternating Pulse Acceleration and Deceleration

Knowing the people could control pulse rate, Dr. Engel and his associates now attempted to teach five women to accelerate and decelerate their heart rates in a cyclical manner. Lying on a cot in a darkened room, wearing a strain gauge to register respiration, each woman saw suspended above the foot of the bed three lights and a clock. Whenever the upper light was on, it was a cue to speed heart rate, the bottom light signalling a cue to decrease heart rate. They would know a correct response when the middle light went on, and they would be paid for the time they kept it on. In an alternating fashion the upper and the lower light would go on. These upper and lower cue lights would flash on at one-minute intervals so that the subject had to increase, then decrease, heart rate on cue in two-minute cycles in order to keep the reward light lit 50 percent of the time. Each day the automatic trigger was reset so that the task was more difficult since the individual had to speed her pulse more, and slow it more to turn on the reinforcement light. Although speeding was more easily learned than slowing, the subjects exhibited a remarkable ability to control their heart rate from minute to minute. All of the subjects learned to

alternate speeding and slowing heart rate according to the cue light, but only two of the five women could do it consistently in every experimental session. Ironically, the two women who guessed that the experimenters were reinforcing heart rate or blood pressure were the two who had most difficulty learning control. The others did not know what function was being rewarded by the light.

Heart Rate Studies in Monkeys

The studies with people certainly indicated that it was possible to control heart rate, but did not indicate how, by what mechanism. Dr. Engel, now working with Mr. Sheldon Gottlieb at the Gerontology Research Center in the National Institute of Child Health and Human Development, in the Baltimore City Hospital, trained three rhesus monkeys to slow and speed heart rate, in order to avoid an electric shock. The monkeys had been implanted with a permanent catheter in the iliac artery, from which systolic, diastolic blood pressure and heart rate were measured. The animals became very reliable at slowing, and speeding pulse, and it was clear that the shocks did not prompt a speeded pulse, for one monkey received more shocks for failing to speed, than for failing to slow his heart rate. When heart rate was accelerated, there was no concomitant increases or decreases in blood pressure, but when heart rate was slow blood pressure fell slightly. This suggested that the animals were not using pressor reflexes to control pulse rate, for if pulse rate had depended upon blood pressure controls, there would have been strong inverse correlations between pulse and pressure. If the monkey experiments did not reveal the mechanisms of pulse rate control, they corroborated the fact that mammals can be conditioned to effect a very fine control over pulse rate.

Conditioning Patients with Cardiac Arrhythmia

The rhythmic pumping of the heart normally fluctuates in a very regular manner, a little faster and a little slower. Pulse rate, blood flow and blood pressure are synchronized in a complicated fashion with a person's activity, whether resting or running, and with his rate of respiration. Thus, in health, the portions of the heart muscle contract and expand in a smooth, cyclical manner. Localized heart, or nerve damage, however, may cause one portion of the heart to get out of rhythm. There are many kinds of heart arrhythmias. One extremely serious variety is the arrhythmic caused by a premature ventricular contraction—known as a PVC. It often occurs after a heart attack, or myocardial infarction, in which the heart suffers some death of tissue in a place where

circulation has been blocked. PVCs are non-functional heartbeats since they occur at a time when the ventricle—the main pumping chamber of the heart—is not filled with blood.

When Dr. Bernard Engel decided to try feedback conditioning for patients with PVCs, he selected a large group of cardiac patients who had 10–20 premature contractions a minute, a serious and potentially dangerous disruption of the rhythmic pumping of blood.

Earlier physiological researches had suggested that ventricular contraction might be influenced by hypothalamic stimulation, or by stimulating the vagus nerve, that multipurpose nerve branching to the heart, lungs, larynx, and stomach. Ventricular contraction can be modified by cutting the sympathetic nerves to the heart, thus depriving the heart of one of its pathways from the autonomic nervous system.

Dr. Engel hoped that patients with PVCs might learn to control them, and might possibly reveal some clue to the internal “tricks” they used. He began intensive work with eight patients, each of whom came to the hospital laboratory for training over a period of about three weeks. The procedure was identical to the one in which healthy subjects had learned to raise and lower heart rate. During the first ten sessions, the patient was reinforced for speeding his heart rate, while in the next ten sessions he had to learn to lower the pulse rate. In the next stage he had to learn to maintain heart rate within a narrow range. A single premature beat would raise the heart rate above the range, and in the pause that followed, the heart rate would fall beneath that range. This meant that the patient had prompt feedback each time he had a premature ventricular contraction.

In the final stages of training, the patient was slowly weaned away from the feedback. The lights would go on in response to his pulse control for only one minute out of eight. At this point the successful patients were becoming aware of their premature contractions by their own sensations. Five of the eight patients demonstrated control over their contractions, but three did not. Four of the eight were able to suppress a lot of their premature contractions to a degree that appeared to be clinically significant. While undergoing training the patients' electrocardiograms were monitored for three nights a week, by telemetry, while they lived on a hospital ward. Generally, the telemetry data resembled that of the laboratory: the patients reduced their premature beats in the laboratory, and they had fewer premature beats on the ward.

One middle-aged woman who had had five heart attacks showed very few premature contractions on follow-up studies even two years later. Initially, she interpreted her abnormal rhythm as nor-

mal and she thought that she was dysrhythmic when her heartbeat became regular. Once she was allowed to examine her cardiograms, and her records were explained in detail, she learned to recognize and reduce premature ventricular contractions. Whenever one occurs to her at home, she now reports, she sits down and rests, and they go away.

Subjective Reports

One man speeded his heart to control the arrhythmic contractions, one kept a middle course, and two people slowed their heart rate. In the man who accelerated his heart beat to gain control, it was possible to show that PVCs were not related to the absolute level of his heart rate. The fact that PVCs occurred more when he was slowing heart rate or resting, suggested that his control of the premature contractions depended upon active neural processes, probably reducing input to the heart from the sympathetic nervous system. However, the exact nature of these neural processes was not revealed by subsequent studies with a variety of drugs that act upon the autonomic nervous system.

Each patient was somewhat different. One young woman in her mid-thirties, for instance, showed premature ventricular contractions and very abnormal cardiograms when she was angry or excited. Indeed, she could feel a thumping in her chest during strong emotion, or after mild physical exercise. In order to decrease premature ventricular contractions, this woman learned to slow her heart rate, which she said she accomplished by imagining herself in a swing, swinging back and forth, or riding a see-saw. In her case, drug studies suggested that premature contractions were suppressed by strong input from the vagus nerve, and were increased when vagal input was blocked by drugs. For a number of months after conditioning, this patient's cardiograms showed frequent premature contractions, which decreased only slightly after training. On the other hand, conditioning seemed to have given the woman a sense of mastery, and she claimed that she could stop these arrhythmias at home, and that she no longer felt the thumping in her chest, nor any dizziness.

Case studies have displayed the complexity of biofeedback or operant therapy. One elderly man seemed not to be able to sense his PVCs during the first 24 sessions of conditioning: only when he returned to the laboratory for a second attempt at training did he find himself able to feel a "sensation of warmth," and notice sweating when the premature contractions became frequent. Three patients did not respond at all: one had a very enlarged heart and died shortly after his last visit to the clinic. One man may have been afraid of improvement, since he thought he might

lose his disability benefits. In some instances the heart may be too diseased for operant therapy, while in others a person may have accommodated to the abnormal symptoms and may have to learn to be comfortable without them.

The study has indicated the great flexibility of operant conditioning in therapy. It permitted patients to control PVCs by different physiological mechanisms, by influencing the vagus nerve, or possibly by influencing the autonomic instructions from the hypothalamus. Among only eight patients, it was possible to see that heart rate, per se, did not influence PVCs; for one patient decreased them by accelerating heart beat, while another slowed heart rate to reduce PVCs.

The heart is innervated in a complicated manner, and there may indeed be many "internal routes" that a person might "use" in controlling its rhythmicity. As these studies indicate, our language of physiological sensation, our descriptions and articulation of inner movement remain as primitive as the first calls of our monkey ancestors. Our clichés about the manner in which emotions, memories, or internal states affect our physiology clearly are misleading. Not everyone causes his heart to accelerate, or his blood pressure to increase by thinking of stressful events, and generating tension—some people said they swallowed. Nor do people necessarily relax in order to slow down their pulse. The slick magazine clichés ("her heart raced as she thought of their quarrel," etc.) may only represent the misleading way in which we try to articulate to each other what we are doing internally. It seems paradoxical, indeed, that many people in Dr. Engel's studies, and in many other biofeedback laboratories, have shown such an ability to control various aspects of heart functions, along with so little idea about how they did it.

The Specificity of Autonomic Responses: Skin Potential

When the autonomic nervous system was being rediscovered in the 1960s, the usual sequence of experimental development was reversed: now, much of the early work was carried out with humans rather than animal subjects. Among the first researchers to lead us to a greater appreciation of the adaptability and refinement of autonomic functioning were Dr. David Shapiro and Bernard Tursky of the Harvard Medical School. For many years they had studied the autonomic response manifested in tiny changes of electrical potential as measured on the palm of the hand. This skin potential response is similar to the GSR. In 1963, they began to explore the specificity of the skin potential response. Other researchers were beginning to challenge the traditional view of autonomic functioning by showing that a response could be made

contingent on external reinforcement; that is, that an autonomic function could be shaped by the environment just as other central nervous, or somatic, functions are shaped. In their laboratories at the Massachusetts Mental Health Center in Boston, Shapiro and Tursky wished to extend this exciting finding. They wondered if the GSR behaves independently or if other autonomic or somatic responses are closely related to it?

Working with a colleague, Andrew Crider, Shapiro and Tursky studied 18 student nurses, divided into experimental and matched control groups. Experimental subjects were rewarded whenever they produced a skin potential response, which was defined as any change of 0.5 millivolts or more, during a single, 30-minute session. Control subjects received an equal number of rewards, but rewards were *not* contingent upon their skin potential changes. In addition to the key variable—skin potential changes—respiration, heart rate, and skin potential level were continuously monitored throughout the session.

The experiment was done a second time after a lapse of several days, and the results were similar to that of the first session. The investigator confirmed that this autonomic response could be predictably modified by an environmental contingency. Experimental subjects produced significantly more skin potential responses than controls. However, the experimental and control groups did not differ on the other physiological functions—which indicated that the increased occurrence of skin potential responses was a specific change.

This evidence for the specificity of an autonomic response further challenged the traditional view of autonomic nervous arousal as massive, bodywide, undifferentiated arousal. On the contrary, as the Harvard group showed, specific reinforcement from the environment can be used to change selectively the response of a single autonomic function. (Since the report of this work in 1964, Neal Miller and Leo DiCara published a monumental series of studies with curarized laboratory animals. They demonstrated that autonomic responses can be modified without mediation of motor responses. They did this by using doses of curare to block muscle activity totally. Even under curare, exquisite refinements of autonomic control are possible—e.g., rats learned to dilate the blood vessels in one ear, but not the other, when differentially reinforced.) Encouraged by their positive results, Shapiro and Tursky then began work with a more complex physiological system, blood pressure. Their struggles to measure blood pressure for experiments led to techniques that will vastly refine the diagnosis of patients in clinics in the future.

Blood Pressure: Measurement Breakthrough

Before they could begin their studies, they had to figure out a way of obtaining continuous readings of blood pressure. Blood pressure varies with every beat of the heart. The standard clinical procedure, familiar to anyone who has ever had a physical examination, is to wrap an inflatable cuff above the elbow, pump air into it until it cuts off the blood flow in the artery, then release the air gradually while listening with a stethoscope for the turbulent sound of the blood flow returning in the artery. The sound is known as the Korotkoff sound (for the Russian physician who first described it in 1896). The cuff pressure level at which the Korotkoff sound is first heard is that of systolic blood pressure caused by the expulsion of blood from the heart's contraction. The lower level at which the sound becomes muffled or imperceptible is diastolic blood pressure; the pressure when the heart is filling with blood. This time-honored clinical method does not indicate average pressure changes over time, nor can it be used to reveal pressure changes from one heartbeat to the next, over several successive heartbeats. The method routinely used in animal experimentation was inappropriate, because it involves inserting a fine catheter tipped with a miniscule pressure-sensitive device directly into an artery. Many months of concentrated effort went into the measurement problem. The solution finally devised by Shapiro and Tursky is as simple in operation as it is brilliant in conception.

A conventional cuff is used; mounted in it is a small crystal microphone. The entire system is automated. Cuff pressure can be held constant at any given level or be increased or decreased in discrete steps of 2 millimeters (mm) Hg. The presence or absence of Korotkoff sounds is detected by the microphone, whose output is funneled into an audio system for feedback to the subject and into a polygraph for visual display. Pressure levels, heartbeats, and respiration are recorded on other polygraph channels. In practice, the first step is to determine the subject's median systolic blood pressure by setting the cuff at a constant pressure at which half the Korotkoff sounds can be detected. This is calculated on the basis of 50 consecutive heartbeats. At each successive beat of his heart, the system can inform the subject whether his blood pressure is rising or falling from the median level or is at that level—via some feedback stimulus, such as a tone or flash of light. Outside the subject's training room, the researchers can follow cardiovascular events visually by watching the polygraph pen which marks a blip for every occurrence of the Korotkoff sound.

The system fulfilled the investigators' requirements perfectly for it enabled them to reward a subject every time he produced a

desired blood-pressure condition. (Moreover, in the estimate of one research cardiologist, the system is the most significant advance in the procedure for measuring blood pressure since Korotkoff's work.) Having developed the basic instrumentation, Dr. Shapiro, Tursky and various coworkers embarked on a series of experiments with healthy young college men as subjects.

Learning to Control Blood Pressure

The same methods and procedures were used in all studies, and the median blood pressure was calibrated for each subject individually. The investigators determined the cuff pressure at which Korotkoff sounds occurred on half of 50 successive heartbeats and used this cuff pressure at the start of experimental trials. Thus, every subject started with the same 50 percent probability of reinforcement. Subjects matched on initial blood-pressure levels were randomly assigned to the experimental conditions. For example, there were two conditions in the first study of the series (*up* and *down*), in which subjects were reinforced for raising and lowering blood pressure respectively. It is worth repeating that the subjects were all healthy college-age men whose initial blood pressures were well within the normal range. The researchers had turned down any candidates with blood pressures greater than 135 mm systolic or 85 mm diastolic.

Each young man was told that the study was concerned with the ability to control certain physiological responses, and that many people can learn such control when given information about the responses. A light would flash and a tone sound whenever he produced the desired response. Moreover, he would be rewarded for each 20 correct responses with a brief view of an interesting colored slide (e.g., *Playboy* magazine nudes). He was *not* told that blood pressure was the target response and, because he wore other sensing devices in addition to the blood-pressure cuff, he had no way of knowing which component of his body's functioning he was supposed to control.

Subjects sat in comfortable lounge chairs in a quiet, moderately lighted room, informed by a blue light of the start of an experimental trial. Approximately one minute in duration, each trial consisted of 50 successive heartbeats at a constant cuff pressure. A rest period of some 20 seconds followed, during which time the cuff was deflated. Twenty-five trials constituted one complete experiment. When, on two consecutive trials, a subject succeeded in producing the correct response on 75 percent or more of his heartbeats, cuff pressure was altered by 2 mm to keep the task difficult. For example, pressure was raised for subjects in the *up* condition and decreased for those in the *down*. Conversely, when a subject

did poorly on two trials in a row (responding correctly on fewer than one quarter) pressures were altered so as to make the task easier.

Within the framework of these methods and procedures, then, the Boston investigators carried out two studies concerned solely with systolic blood pressure. Their question was, can an individual gain control of systolic blood pressure if given continuous feedback information about blood pressure and rewards for correct responses? Their results were unambiguous and affirmative. Individuals could be conditioned to decrease systolic blood pressure significantly, but the results were not so clear in those who had raised blood pressure.

Groups of subjects in *down* conditions produced dramatic decreases after a single 30-minute session. Groups in *up* conditions, on the other hand, tended to increase pressure at first, then to show a slight decline. *Down* subjects lowered systolic blood pressures as much as 4.0 mm, compared to a 0.6 mm decline for *up* subjects. In the second study, Shapiro and Tursky, joined by Gary E. Schwartz, a graduate student in their laboratory, found that a group given random reinforcement produced pressure-level changes about midway between the *up* and *down* values; that is, they tended to produce gradually declining systolic blood pressures.

A preliminary look at the durability of training to lower pressure suggested that it did have some lasting effects. Thus, after a brief period of mild exercise and rest, *down* subjects began a second experimental session with pressures lower than their initial baseline values, whereas *up* and *random* subjects tended to return to their original values. Moreover, when *up* and *random* subjects were put in a *down* condition in a second experimental session, their pressures did not decline as markedly as did those of *down* subjects given a second session of *down* reinforcement.

How did these men go about lowering their blood pressure? Their subjective reports do not shed any light on the mystery. Like Dr. Engel's subjects, most of them did not guess which of their body's responses was the key one that had been rewarded. They had absolutely no sense of control over the appearance of the light and tone. Moreover, their reports conflicted. Both *up* and *down* subjects inferred that the investigators wanted them to get excited—probably the slides of nude *Playboy* models inspired that guess, but a few in the *down* condition thought the light and tone might indicate a relaxed state. One pilot subject had showed fantastic heart rate control, but when asked how he did it, he shrugged and responded talmudically, "How do I move my arm?"

In short, the investigators could gain no insight from even the most successful subjects about *how* they attempted to gain control.

Unlike Yogins and practitioners of other body-mind disciplines, we Westerners have had little opportunity to learn internal control. Indeed, for many generations, we have been taught that it was impossible and that our attention should always be directed outward. With lack of practice and attention to internal control and sensation, perhaps we should not be surprised that we have no language to articulate the mysterious interconnection between some "mental activity" and the workings of tissues and organs. We should not be surprised that our cliched repertoire, supposedly telling us what individuals feel, is quite misleading—and merely accepted because we do not bother to compare our feelings for precise similarity. The sharing of internal experience has been low in our hierarchy of values until very recently. It is laboratory experimentation, under the most rigorous conditions, that is forcing us to reconsider how we will communicate about internal changes, subtle shifts in body and consciousness—so that we may ultimately reveal some of the connections between mental activity and body changes.

The irony is considerable. One primary reason for using human beings rather than animals in this research—although human experiments are inconvenient—was the hope that people could "tell" the researchers what they were doing. It was not possible to gain this information for the control of blood pressure; nor in subsequent studies of heart-rate control.

Heart Rate

Heart rate and respiration had been monitored during the blood-pressure experiments and were not related to the pressure changes. Heart rate declined slightly in all subjects and breathing patterns were undifferentiated. This additional demonstration of specificity in autonomic responses was especially impressive because heart rate is a major component of blood pressure, others being heart-stroke volume and peripheral resistance factors, such as the relative flexibility of blood vessels and arteries. The Boston researchers were intrigued by this apparent decoupling of two intimately related functions. Dr. Engel and coworkers had already shown that heart-rate control could be learned, but had not looked at the course of blood-pressure changes in their work. Shapiro, Tursky, and Schwartz decided to investigate the degree of behavioral differentiation between these two physiological functions.

Using the same experimental approach as they had for blood-pressure training, the researchers provided instant-feedback in-

formation and reinforcement for correct responses to two groups of college men. Subjects in one group were rewarded for speeding, those in the other for slowing their heart rates, relative to each subject's median heart rate. As expected, the groups showed statistically significant differences in heartbeats per minute (bpm) after one, half-hour training session. The group average for *slow* subjects declined by 5 bpm; the *speed* subjects tended to increase their heart rates, then return to baseline rates. More interesting, yet, blood-pressure levels hovered around initial values throughout the experiment, and there were no differences between the groups. Comparing the ten most skillful slowers and speeders, the investigators found a 14-bpm difference in heart rate in association with virtually identical blood-pressure patterns.

Thus, as their earlier studies had suggested, even such closely interdependent autonomic responses as heart rate and blood pressure can be individually trained by using feedback and reinforcement. These results increased confidence in the possibility of using behavioral therapies to help patients with diseases such as cardiac arrhythmias or essential hypertension. Initial work with these clinical problems is certainly encouraging, as Dr. Engel's success with the PVC patients illustrates. In addition, very promising preliminary results have been obtained with hypertension patients. Dr. Herbert Benson, an internist working with the Shapiro group, is transferring these techniques from the laboratory to the clinician's office (see below).

Cardiac Gymnastics, or Decoupling Heart Rate and Blood Pressure

Shapiro, Tursky, and Schwartz now asked whether subjects could learn specific patterns of combined heart rate-blood pressure (HR-BP) functioning. Having shown that each of these autonomic responses could be independently controlled, they now sought to determine how combinations of the responses could be brought under voluntary control. The logic of autonomic learning emerging in their studies suggested that *any combination of responses can be learned if the desired pattern is reinforced every time it occurs*. The initial requirement, then, was an automated, on-line system for sensing, analyzing, and signaling information about heart-rate and blood-pressure activity.

They developed such a system. Each heart cycle was defined as starting at an R-spike and ending at the subsequent R-spike. The system detected one of four combinations of HR-HB responses. Two were conditions of integration: HR and BP both increasing or both decreasing; and two were differentiation conditions: HR rising and BP falling or vice versa. Judgments about increases or decreases were relative to each subject's median HR and BP.

In a pilot study of ten college men, the investigators tried out the system. By rewarding subjects each time they spontaneously produce the desired combination of autonomic responses, they got them to produce that cardiac pattern at will. Half the subjects were given feedback as a reward when HR and BP were increasing simultaneously and half when heart rate and blood pressure were simultaneously decreasing. Both groups succeeded. Subjects given feedback for lowering activity did especially well. For example, one young man learned to slow his heart rate by 8 bpm and drop his blood pressure by 12 mm. Thus, both the system and the idea seemed to be sound.

In his doctoral dissertation, Schwartz confirmed that integration of HR and BP (either lowering both or raising both) could be learned easily in a single session. Again, the down-down condition yielded the more dramatic results. Indeed, the decreases in activity were greater than those learned when HR and BP decreases had been individually reinforced in earlier studies.

Cardiovascular differentiation was also demonstrated among subjects rewarded for the more complicated pattern of lowering heart rate but increasing blood pressure, or the reverse—lowering blood pressure and increasing heart rate. Only a few subjects seemed able to go through some complicated cardiac gymnastics to decrease heart rate and increase blood pressure. Schwartz suggested that they did it by first increasing HR and pushing BP up high, then gently nudging HR down to just below threshold. Holding HR down while BP was up, he said, probably demanded the skill and delicacy of tight-rope walking.

Schwartz has attempted to illuminate the general phenomena seen in this study by means of a model which draws on concepts of operant conditioning and biofeedback training. The model indicates that the shape and extent of learned autonomic integration and differentiation can be predicted on the basis of "1) the relationships over time between responses as defined by the reinforcement procedure, and 2) natural physiological mechanisms or restraints that exist over time."

The first of these factors takes into account the natural degree of integration between two autonomic responses and the nature of conditioning feedback experimentation. "For example," Schwartz noted, "if BP and HR are naturally completely integrated, that is, if they are always increasing and decreasing together, then when an experimenter chooses to reinforce one, he will end up simultaneously reinforcing the other as well, whether or not he is aware of it." In the case in point, however, the researchers have shown that HR and BP are not tightly integrated, for they could alter one without affecting the other. Thus, when BP increases were

reinforced, HR was receiving random reinforcement and therefore was not induced to change. Analysis of baseline data revealed that BP and HR *do* have a slight tendency to increase or decrease together. On this basis, the model would predict that it would be easier for a subject to integrate than to differentiate the activities. And, indeed, the investigators found this was true.

The model also deals with the natural predilections of autonomic functions; for instance, the general tendency for BP to decline during the course of an experimental trial. The investigators came upon another example when their analysis of baseline physiological data disclosed that the heart leads the way and blood pressure follows in the natural situation. This helped explain why the up-BP/down-HR combination was very difficult to attain for any length of time. These experiments may begin to reveal what people "do," their cardiac "habits" that may lead to strain and illness. However, in studying cardiac responses with people it is important to know the body's natural constraints, limits beyond which individuals should not go for their own safety. Although it appears that autonomic responses may not be as malleable as those under central nervous system control, experience points to the wisdom of setting upper and lower limits of activity to protect eager subjects from injuring themselves. The Boston researchers did this as soon as they found that some subjects could drive up blood pressure or heart rate to alarmingly high levels, producing changes that looked like they had just made the 100-yard dash.

The limits of safety are being explored with animals, not human beings, and by independent researchers.

Drs. Allan Harris and Jack Findley at Johns Hopkins University have been studying blood pressure and blood pressure control in baboons. Animals, with sensors implanted in the femoral artery, are seated in working chairs at panels that supply complex signals and rewards. As animals are exposed to conflict and stressful situations, the investigators are exploring the kinds of situations that may cause blood pressure to rise.

Animals are also trained to control blood pressure in studies that may indicate the limits of visceral control: will an animal raise blood pressure, or lower it, to the point of dying? What are the limits to which training may be extended? Another question in the minds of the experimenters is exceedingly practical. Can the individual who has learned to control blood pressure maintain his control under stress? How will this affect his ability to perform on tasks?

Animals have been conditioned to sustain high blood pressure for long periods—up to three weeks. It is now possible to make an animal sustain high blood pressure voluntarily for such a long

time that it may be the first stage in effects that become irreversible. Thus, this experimentation may be a first indicator of the way in which life situations condition human beings into the illness known as hypertension.

Hypertension in Monkeys and Man

A clinical study of hypertensive patients is being directed by Dr. Herbert Benson in collaboration with Shapiro, Tursky, and Schwartz. Dr. Benson, a specialist in internal medicine at the Harvard Medical School, has been interested in understanding how interactions of behavioral and environmental factors are involved in the development of hypertension. There have been many studies of this problem in the three decades since Franz Alexander formulated the concept of hypertension as a psychosomatic disease. Some investigators have attempted to define a hypertensive personality, linking the illness to such attributes as high emotional reactivity and excessive drive and aggressiveness. In recent years population studies have tried to pinpoint those aspects of the social environment associated with a high incidence of the disease. According to this work, urban living, socioeconomic mobility, and a high standard of living may increase a person's chance of becoming hypertensive. In a recent review of these many studies, Dr. Benson and coauthor Mary C. Gutmann noted that "environmental stress" was a recurring theme although it was never very clearly defined. Phrasing their own version of the theme, they suggested that development of hypertension may depend on the extent to which an individual is confronted with continuous change in his environment and on his ability to cope with the constant uncertainty this change evokes. Dr. Benson has explored this hypothesis in an experiment with monkeys, and the results he obtained gave him the requisite animal model for the work with patients now underway.

In the animal experimentation, Dr. Benson worked with Drs. J. A. Herd, W. H. Morse, and R. T. Kelleher, who had earlier shown that monkeys develop characteristic increases in blood pressure along with certain patterns of key pressing. The animals had been trained to press a key in order to prevent an electric shock to their tails. Once they learned the task, their blood pressures were found to increase whenever a light went on signalling them to begin key pressing, and to fall when the key-pressing requirement was completed and the light went off. Dr. Benson joined these experimenters in a second study of this phenomenon.

This time the animals were trained, as before, to press a key when the white light went on in order to avoid shock. When they had mastered this task (30 presses within 20 seconds turned off

the light and cancelled shock delivery), they were presented with a new stimulus. This was a blue light; if it went on and stayed on for a certain interval, the white light went off even if the required number of key presses were not made. Onset of the blue light was controlled by increases in an animal's blood pressure. Thus, at this stage of training, the monkeys learned to avoid pain either by key pressing *or* by increasing blood pressure 5–10 mm Hg.

Now the investigators removed the key from the animal chamber, which made the blue light the only resort for avoiding shock. At first the monkeys scrabbled at the hole where the key used to be, then they seemed to forget it and sat quietly watching the lights. During this phase of the experiment, called the pressor phase, the requirements for activating the blue light were changed such that an animal's blood pressure had to climb steadily higher and remain elevated for longer and longer periods. After several training sessions under these conditions, at a point when the animals could maintain blood pressures at levels 25 mm Hg. greater than pretraining levels for 20 minutes or longer, conditions were again altered for the fourth and last phase of the experiment. This was the depressor phase. The blue light was controlled by *decreases* in blood pressure, and thus the monkeys were trained to avoid shock by decreasing blood pressure.

The results of this study provided an impressive confirmation of the power of environment to affect blood-pressure levels. As in the earlier work, the researchers found a pattern of increase followed by a return to normal levels—about 121 mm Hg.—during the initial key-pressing phase. The pattern was also seen in the first sessions of the pressor phase. In the later sessions, however, a remarkable change took place: the monkeys' blood pressure levels drifted gradually upward. In the final stages of this phase, mean blood pressure averaged 141 mm Hg. at the beginning, and 150 mm Hg. at the end of training sessions. These findings indicated that the act of key pressing was not itself involved in sustained blood-pressure elevations; rather, the elevations were under the control of an environmental stimulus, the white light. Moreover, depending on the scheduling of presentation, such a stimulus can effect changes in either direction, for the researchers were also able to train the animals to lower levels during the depressor phase of the experiment.

Dr. Benson feels there may be certain parallels between what happened to the monkeys and what happens to people living in technologically advanced societies like our own. The autonomic response of increased blood pressure is one of the body's survival tactics by which it adjusts to a change in the environment. Yet some of these physical responses are not appropriate to the

changes that occur in our society, for the changes are mainly sociocultural in nature. Thus, people are living under environmental conditions which elicit a rise in blood pressure akin to conditions that monkeys were exposed to when the key was removed. And, like the monkeys, a great many people may develop high blood pressure as a result.

If the findings indicate that our way of life exacts a heavy human toll, they also suggest a new method for helping the victims to help themselves. About 25 million Americans have hypertensive disease, in which persistent elevation of blood pressure is the chief symptom. In nine out of ten cases the diagnosis is essential hypertension, which means that the causes are not known. The fact that hypertensive monkeys can be trained to lower blood-pressure levels suggests that hypertensive people might be taught to do the same. It is this possibility that Dr. Benson and his associates are now exploring in patients with essential hypertension.

The patients come every day to Benson's office at the Channing and Thorndike Memorial Laboratories in Boston City Hospital. Training is carried out in a tiny anteroom just big enough for a comfortable chair and the bulky feedback instrumentation, which duplicates the system developed by Dr. Shapiro and his colleagues. All the patients are fully informed about the goal and methods of training. For the first five to fifteen days of his participation in the study, a patient simply sits in the training room for an hour; the blood pressure cuff is on his arm and the equipment is continuously recording his blood-pressure levels, but no feedback is given. The records obtained during these sessions are the baseline data. The researchers want records for several hours so they can judge whether the procedure itself—even without feedback training—induces drops in blood pressure. Then the feedback training begins, following the methods developed by the Shapiro group. A light and tone go on every time a patient's systolic blood pressure is below that session's starting level. Twenty such reinforcements earn him a more substantial reward—brief viewing of a photographic slide, a mountain landscape or a colorful village street scene, and a small sum of money.

Six patients have entered the study to date. As a group, their median systolic blood pressure before training was 167.4 mm Hg. This declined to 151.1 mm Hg. during the last five training sessions. The most successful case was that of a gentleman who began with a systolic level around 160 mm Hg. and was showing levels around 130 mm Hg. after three months of training. When Dr. Benson stopped the feedback for a few days, the patient's pressure drifted upwards slightly but nowhere near his original control level. Usually tense and complaining when he was first

seen at the lab, the man later declared that he was learning how to relax and stopped worrying about the teenage daughter who was giving him trouble. Not all the patients did so well, of course. In individual patients, systolic levels decreased by 33, 30, 17, 16, 3, and 0 mm. The wide range of these results suggest that, like other valued therapies, the technique of learned blood-pressure control may not help every hypertensive patient, and it is hard to predict how many beneficial results will persist outside the laboratory. For some, however, it may be the means of adding years of well-being to their lives.

In sum, it is clear that a variety of studies of cardiac control—using biofeedback or operant conditioning—are setting the stage for a considerable revolution in the treatment of a number of cardiovascular illnesses. As Dr. Engel has demonstrated, some of the most elusive and frightening cardiac arrhythmias can be controlled by patients if they are caught at a stage when the heart is not too damaged. When Dr. Shapiro, Tursky, and Schwartz showed that people could simultaneously control both heart rate and blood pressure, they were pointing the way toward a new behavioral therapy for angina pectoris. This is a painful condition in which the supply of oxygen to the heart is insufficient. A patient with angina might be able to halt the chest spasms that occur with ischemia, by decreasing heart rate and blood pressure, thus reducing the oxygen requirements of the heart. Experimental demonstrations of blood pressure control have already encouraged clinical studies, and patients with essential hypertension are being trained to control blood pressure by Dr. Benson, by Dr. Albert Ax, at Lafayette Clinic, and Dr. Neal Miller, at Rockefeller University.

The new measurement techniques, devised for experimentation, along with the techniques of conditioning patients to alleviate their own symptoms may help to induce an entirely new attitude among patients with cardiovascular disease. The patient who learns to control his own symptoms, his own blood pressure, and arrhythmias has acquired a psychological advantage that may actually help as much as symptom control—he is no longer the helpless person taking a pill. He is beginning to gain access to the signals of his own body—to exert control. Instead of remaining the dependent recipient of aid in pharmaceutical form, the patient is being given the dignity of learning, insofar as he can, to take care of himself.

As biofeedback techniques and operant conditioning become more extensively used throughout medicine, a new attitude toward health and health care may arise. Similar methods may be applied

during diagnosis of potential cardiac and other disease, and might allow preventive training for people with ominous signs.

Perhaps, as experimentation continues in laboratories around the country, the emergent attitudes toward controlling the autonomic nervous system, and the new interest, will help us to discover connections between feelings and bodily responses. Ultimately, we may begin to evolve a vocabulary, through the use of feedback instruments, so that an individual can tell another how to raise his heart rate, or lower his blood pressure, how it affects gastric acid is about to squirt into the stomach, and in order to change his GSR. Ironical, that language and mental activity and physiological response, seems something we have to develop in our scientific laboratories. Science, indeed, may have to give us some of the tools for comparing and articulating inner experience and bodily changes.

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Physiological Effects Of A Meditation Technique and A Suggestion for Curbing Drug Abuse

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During the last several years an estimated 50,000–100,000 people have begun to practice Transcendental Meditation (sometimes abbreviated as TM) in the United States. This is a simple procedure in which an individual sits with eyes closed and mind somewhat passively focussed inward on a repeated sound, for about 20 minutes at a time. Although it sounds totally innocuous, the physiological effects are measurable and may indeed be profound. Transcendental Meditation has great appeal for students and has coincided with the diminution or abandonment of drug use among many meditators. The method is also being adopted by businessmen and other professionals, perhaps as an antidote to the pressures of an excessively busy and externally oriented life. The research of Dr. Robert Keith Wallace (supported by an NIMH training grant at UCLA) has indicated that there are decided physiological changes during Transcendental Meditation that may make it beneficial to health and may help account for the growing adherence. During research for his doctoral dissertation, Dr. Wallace took a number of physiological measurements on volunteers while they rested quietly, and while they meditated. He found that during meditation—by contrast with ordinary resting—respiration rate, heart rate, and oxygen consumption decreased notably, and there were other physiological signs of profound relaxation. Subsequently, Dr. Wallace began a collaboration with Dr. Herbert Benson, a cardiologist at the Thorndike Memorial Laboratory of Harvard Medical School in Boston, who was also studying the

physiological effects of Transcendental Meditation. Their survey of 1,900 meditators turned up the interesting evidence that drug use had declined after individuals began meditation. They plan to study 10,000 high school students in an effort to discover the effect of Transcendental Meditation upon attitudes and drug use. They also hope to study the effect of the procedure on patients with high blood pressure. Disciplines of Yoga and pure meditation have long been reputed to bring pervasive benefits to health, but it is only now that American physiologists and physicians have the opportunity to study a sizeable population of practitioners.

Background

Transcendental Meditation has an historical background in Yoga tradition. Now, as Eastern and Western philosophies meet, and large numbers of Americans search for a way of self-development in Asian spiritual traditions, one of the great benefits is likely to be an infusion of new concepts of health, and of medical alternatives into Western medical practice. As Asian disciplines specify, each individual has a far greater ability to improve his health and influence his well-being than he is given to believe. Students, philosophers, psychologists and others who have been searching for a kind of spiritual development not easily found in the United States, have reached back to the traditions of the remote past—many of these seekers have begun to practice some of the many forms of meditation.

Most of these methods have their roots in the ancient discipline of Yoga, one of the systems of Hindu philosophy, whose precepts can be found in Christianity (and which manifests itself in the word "yoke" in the Bible). Yoga, a Sanskrit word from which "yoke" derives, means "union" or "conjunction." Myth says that the philosophy of Yoga arose from the precepts that Lord Krishna gave his disciple on the battlefield—an occurrence that is celebrated in the story of the Bhagavad-Gita. Historically, Yoga was a tradition that flourished in Southern India for at least a thousand years B.C., and was said to have been codified by Patanjali, whose aphorisms are now widely read by college students.

By a conjunction of disciplines, the Yogic practitioner comes to master himself physically and psychologically, following exercises, abstinences, and meditation that at once contribute to a state of health and physical well-being, and of spiritual evolution. Quite a few Yoga masters have demonstrated their ability to alter "involuntary processes," changing blood flow, skin temperature, heart rate, digestive activity, oxygen consumption. Some have had themselves interred in almost airless boxes, or buried alive for many hours or have walked barefoot over hot coals, or cleansed their

digestive tract by swallowing many feet of cloth. A few of these remarkable feats have been studied by scientists who have tracked certain physiological parameters, such as heart rate and volume, EEG, and temperature. Physiological feats are not the goal of Yoga, however, and many forms of Yoga involve purely mental meditations. Some meditations involve paying attention to one's respiration. Some involve looking at a symbol. A common Yogic practice is the mental repetition of a mantra—a euphonious word or group of words (such as the famous OM). In 1959, the Indian sage, Maharishi Mahesh Yogi, introduced a form of mantram Yoga to the United States and Europe—a form that he believed to be particularly suited to Western life. It is known as Transcendental Meditation.

Because meditation involves an inward centering of attention, it is extremely difficult to describe. In Transcendental Meditation, each individual is given a specific mantram—often a euphonious syllable with no “meaning.” No special posture is required. The person simply finds a quiet place where he will not be distracted and sits comfortably with eyes closed, thinking the sound in a relaxed manner for 20 minutes, twice a day. Instead of forcing concentration, or considering the meaning of idle thoughts and reveries that drift through the mind, the individual is instructed to relax enjoyably, and to focus again on the mantram whenever he becomes aware that he has drifted away. The specific mantra of Transcendental Meditation are not mentioned publicly, since one is given to each individual in a teaching ceremony with the belief that the specific mantram has special effects beneficial to the person. Transcendental Meditation is particularly convenient for it is easy to close one's eyes and repeat a neutral “sound” simply sitting in a quiet place, anywhere, anytime, without special posture or arduous training.

As the Maharishi has described it, “The technique may be defined as turning the attention inwards towards the subtle levels of a thought until the mind transcends the experience of the subtlest states of the thought and arrives at the source of the thought.” Normally we are in a wakeful state that involves continuous activity; the mind flits from thought to thought, but we are rarely conscious of being in the present. Buried under the roles one must play, under conditioned attitudes, intentions, and all the self-programming that constitute the busy nature of practical life, there is a flow of energy, an innocent and natural center that might be called the “true being” of the individual who can experience the world without preconceived ideas and structure. The goal of all varieties of meditation—whether they are Sufi, Yoga, Zen, Christian, or other—is to carry the individual toward this essence of

self. All meditations alter consciousness, and many of them appear to produce decided and beneficial effects upon both mental and physiological functioning.

Transcendental Meditation is particularly effortless and enjoyable, requiring no strict concentration or exercises. Other techniques, such as Yoga and Zen have required such heroic concentration that practitioners were hard to study and masters were few in number. During the last 35 years, a number of scientists have attempted to investigate the claim that Yoga and Zen produced "higher" states of consciousness and beneficial changes in physiology. But because expert Yogins or Zen meditators find their meditative concentrations hard to sustain in the laboratory, there has been little physiological data on meditation until recently. (Some of these researchers are cited in Dr. Wallace's dissertation.) Transcendental Meditation is so natural and easy that its effects are experienced very quickly by the novice student. Moreover, the method has been transmitted by instructors who give frequent, scheduled courses in every major city. They work through an efficient national organization known as SIMS—the Students International Meditation Society. (The headquarters is in Los Angeles, and this nonprofit organization has established an Institute to aid scientists interested in pursuing research. Dr. Paul Levine, a physicist and industrial consultant, has been the acting director.)

The first study of physiological changes accompanying Transcendental Meditation was completed by Dr. Wallace at the University of California in Los Angeles, under an NIMH training grant administered by Dr. John D. French, Director of the Brain Research Institute. The physiological findings suggest that the surge of interest and participation in meditation may be considered as a possible contribution to general health, as well as a spiritual odyssey.

PHYSIOLOGICAL STUDY OF TRANSCENDENTAL MEDITATION

Near the UCLA campus in Westwood, there is the National Headquarters of SIMS—where a large number of meditators were willing to volunteer to be studied. The 27 subjects in Dr. Wallace's study were mainly students and former students between 20 and 30 years old, who had been practicing Transcendental Meditation for periods as short as 6 months and as long as 3 years. They had been screened for good health, and none had any physical or mental disabilities. All of them were happy to come to the nearby Health Science laboratories where they were decorated with various physiological sensing devices. An airtight face mask was part of the equipment necessary in measuring oxygen consumption and

carbon dioxide elimination. Electrodes taped to the hand monitored skin resistance to electricity (GSR); while others taped to the scalp picked up the shifting potentials generated during brain activity (EEG); and still others enabled a recording of heart rate (EKG).

In addition, Dr. Wallace measured cardiac output, blood pressure, and respiration rate, and analyzed arterial blood gases in a few subjects. He also determined the concentration of lactate ion in the blood of two subjects.

The Design of the Study

In order to compare the physiological state during ordinary resting and that accompanying the practice of meditation, the study was designed so that each subject acted as his own control.

During an initial precontrol period the subject sat with eyes open in the comfortably erect posture he normally assumed for meditation. After 15–30 minutes, the recording instruments were turned on, and physiological activity was recorded during control, experimental, and postcontrol periods. During the control period measurements were taken for 5–10 minutes with eyes open, followed by 10–20 minutes with eyes closed. Then the subject was asked to start meditating—the experimental period; 20–40 minutes later he was asked to stop. During the immediately succeeding postcontrol period the subject continued to sit with eyes closed for 10 minutes, then with eyes open for the final 5–10 minutes of recording. The total recording time for each subject was about an hour, divided almost evenly between nonmeditation and meditation periods.

PHYSIOLOGICAL CHANGES DURING TRANSCENDENTAL MEDITATION

A number of findings emerged. On analyzing the data, Dr. Wallace saw marked changes in all of the parameters studied, although not all the differences between control and experimental periods were statistically significant. However, the picture that emerged showed the meditation state to be far more deeply quiescent—in terms of physiological and metabolic activity—than a state of ordinary restfulness. Even when an individual closes his eyes and relaxes, for instance, measurements of muscle potentials will show that considerable tension still remains. Thus, there seems to be something accomplished by meditation that surpasses the relaxation obtained when a person merely closes his eyes and relaxes, as suggested by the following findings: The meditators' respiration changed significantly within five minutes of starting their practice. After they began meditating they drew fewer

breaths per minute, and yet their inhalations tended to be shallower than usual. Respiration rate, as measured in five subjects, showed a mean decline of about three breaths per minute.* Oxygen consumption was studied in a group of 20 subjects, and the mean decline in consumption was about 17 percent (40 cc/min.). Carbon dioxide elimination, studied in 15 subjects, declined by a mean of 30 cc/min.

The meditators' hearts were beating more slowly during meditation than during the time just before and after, when they were merely resting. Heart rate was measured in 11 subjects and was found to decrease significantly. The mean decline was 5 beats per minute. The cardiac output, or amount of blood volume pumped by the heart, also declined.

The most dramatic changes were those observed in the resistance of the skin of the hand. Skin resistance has long been used as a measure of emotionality (i.e., the famous lie detector test) because resistance drops when there is more sweat in the palm of the hand, and this is controlled by the sympathetic nervous system, which can be activated by strong emotions. With increased emotionality there is more sweat and lower skin resistance; while lower emotional arousal leaves the palm dry, and resistance to electric current rises. In the 15 subjects studied, skin resistance increased fivefold during meditation, suggesting that sympathetic nervous activity had declined and that they were profoundly relaxed.

The lactate findings seemed to corroborate this state of low emotional arousal, for lactate concentration declined in the blood during meditation. In other studies large infusions of calcium lactate have been used to produce anxiety symptoms in normal subjects and in patients with anxiety neuroses.

Electroencephalographic recordings on 26 subjects gave a similar suggestion of relaxation. During the meditation period there was a predominance of activity in the alpha range (8-13 cps), a change that has been observed by other scientists in their studies of Yoga and Zen meditators. During Transcendental Meditation, there was an increase in the intensity of slow alpha activity (8-9 cps) in the frontal and central regions of the brain, which contrasted with the control period when the eyes were closed but the person was not meditating. All of the subjects had shown alpha activity before meditation when their eyes were closed (nine out of ten people produce this brain rhythm simply by closing their eyes). Recently, other scientists, notably Dr. Joe Kamiya of Lan-

*Substantially the same changes were found in a more recent study that used different methods. (Allison, J., Respiratory changes during Transcendental Meditation. *Lancet* 1: No. 7651, 1970).

gley Porter Neuropsychiatric Institute in San Francisco, have associated the prolonged production of alpha rhythms with a feeling of mental relaxation which is qualitatively alert rather than drowsy.

The EEGs of five meditators showed interesting changes beyond the increased intensity of slow alpha activity. In the occipital and parietal areas, alpha waves predominated, while in the frontal region the alpha waves slowed in frequency and occasionally were replaced by trains of theta waves, a slower rhythm of 5-7 cps.

The Transcendental Meditators appeared to be entering a state that repeatedly produced an integrated and well-defined configuration of physiological changes, a state that might be characterized as profound quiescence of body and mind, a rest "deeper" than ordinary rest. Discussing his data, Dr. Wallace compared the "transcendental state" with other altered states of being that have been produced by hypnosis, or other forms of meditation. He observed that changes in autonomic patterns and EEG have been produced by at least two other techniques: a conditioning, or bio-feedback procedure in which subjects have learned to control heart rate, blood pressure, alpha-wave production;* and other forms of meditation as taught by Yoga or Zen philosophers.

In studying these other meditation states, a number of researchers have found some changes similar to those found by Wallace. Yet Transcendental Meditation is different, for it does not involve forced exercises, special posture or breathing rhythms, nor visual symbols or forced concentration. Unlike most forms of meditation and practice, and perhaps because it is so easy, Transcendental Meditation produces marked physiological changes in beginners as well as in advanced students. In comparing the "transcendental state" to other states of consciousness, Dr. Wallace has emphasized that the slight resemblance to sleep should not be misunderstood, for the physiological and metabolic features differ in significant detail from those of sleep. Nor does it correspond to known hypnotic trance states. The "transcendental state" is an unusually restful state of consciousness, perhaps as natural to man as the universally experienced states we know as waking, sleeping, reverie, and dreaming.

Dr. Wallace's findings do indicate that there may be physiological grounds for the claims of many Eastern philosophers that specially trained states of consciousness are related to physiological changes, which jointly may enhance both the health and happi-

*See the individual reports in this volume describing studies of Dr. Elmer Green; Dr. Barbara Brown; Drs. Bernard Engel and David Shapiro; and Dr. Barry Stermann, whose work was done with animals.

ness of the meditator. Further studies need to be conducted, to ascertain hormones, biogenic amines, and other biochemicals, as they change during the "transcendental state" and comparable states.

Further studies have been initiated. Dr. Wallace, now at the Harvard Medical School, is collaborating with Dr. Herbert Benson in an investigation of the effects of Transcendental Meditation on blood pressure. Scientists at Stanford Research Institute are also looking into this question, while others at Langley Porter Neuropsychiatric Institute are studying EEG and heart-rate records of advanced meditators. Other Transcendental Meditation studies are being planned by researchers in Texas, North Carolina, and California. Dr. Lee Otis, a psychologist at Stanford Research Institute, has asked whether the technique can be taught to people who do not actively seek it—people who are indifferent, or perhaps even hostile to meditation. These diverse researches may help to define the effects of the "transcendental state" in a way that should be exceedingly helpful in medicine and preventive medicine.

Meditation and Health—Mental and Physical

After his initial study, Dr. Wallace conjectured that Transcendental Meditation produced a unique state of being, and although this conjecture has been modified, the original hypothesis of a unique state has generated a good deal of research. With this conjecture in mind, Dr. Wallace wanted to ascertain whether regular meditation did indeed produce any clinically useful effects. He began by surveying a group of students who had been meditating regularly for over three months. Almost 400 of them completed his questionnaire regarding changes in mental and physical health. Some 84 percent judged that their mental health had improved significantly—some specified that they had fewer depressions and suicidal thoughts. Two-thirds reported a significant improvement in physical health, with fewer colds, headaches, and allergic reactions. The data looked promising and suggested that TM might be a relatively safe and easy method for increasing well-being.

One of the most compelling possibilities seemed to be that regular practice might have beneficial effects on high blood pressure. This was suggested by the responses of several individuals on the questionnaire. As it happened, the same potentiality had emerged in a study of Transcendental Meditation conducted by Dr. Herbert Benson, internist and cardiologist, whose work at the Harvard Medical School was independent of Wallace's. The two researchers subsequently joined forces at Harvard and are studying the question more closely.

Meditation: Effects on Drug Abuse

Dr. Benson's investigation turned up one other possibility that compelled pursuit. Many of the people he studied claimed they stopped abusing drugs since they began meditation. Drs. Wallace and Benson followed up this observation in a retrospective study of students who had practiced Transcendental Meditation for at least three months. The researchers distributed questionnaires to the students, and 1,862 forms were completed and returned.

In the group surveyed, males outnumbered females by a sizeable margin: 1,081 to 781. The respondents had been practicing meditation an average of 20 months. Slightly more than three-fourths of the group were between the ages of 19 and 28. A large proportion had attended college or were college graduates. (This has been the composition of the national population of Transcendental Meditators, which numbered about 40,000 when the study survey was made in the summer of 1970.) Most respondents had reported using at least one illegal drug in the past; indeed, compared to data on randomly selected college populations, this group had experimented more extensively with a number of prohibited drugs—e.g., marihuana, heroin, LSD, and other hallucinogens.

The crucial items on the questionnaire asked about changes in drug-abuse habits since beginning meditation, and to these the group responded virtually with one voice: a huge majority reported they had stopped abusing drugs completely. Moreover, the longer a person had meditated, the greater was his change in drug-abuse habits. For example, before beginning Transcendental Meditation, eight out of ten respondents smoked marihuana. After 6 months of practice, only 36 percent continued, while after 21 months or longer 88 percent had become nonsmokers. Similarly, while 48 percent reported using LSD before meditation, 97 percent declared themselves to be nonusers since starting regular meditation. Abuse of narcotics, amphetamines, and barbituates also declined sharply; only about 1 percent of the group were using them. The researchers also found a large decrease in drug-selling activity and a total reversal of formerly favorable attitudes toward drug abuse.

How important was practice of meditation in effecting changes in drug-abuse habits? In answer to this question, a high percentage of those who reported decreased drug use declared that Transcendental Meditation was extremely important in bringing about their change.

Although the study suggested that Transcendental Meditation was a critical factor in the declining drug abuse among these young people, Drs. Wallace and Benson emphasized that it is not

yet possible to give an accurate assessment of its effectiveness in changing drug use. As they pointed out in their report, the subjects might have spontaneously changed their drug activities independently of Transcendental Meditation. Moreover, as the researchers have stated, not enough is known about the natural history of drug abuse -what induces people to start abusing drugs, why they continue, and why they stop. They postulated that whatever motivated the students to become involved with Transcendental Meditation may also have influenced them to stop abusing drugs. If so, meditation was, itself, the result of some prior decision rather than an effector of the changes in drug habits. Further study could help clarify the matter.

Dr. Benson has outlined a study in which two groups of young people would be followed for three or four years. They would be matched on all relevant variables except meditation practice—one group would practice Transcendental Meditation and the other would not. Comparison of the groups' drug activities at the end of the study period would yield a more valid assessment of the effect of Transcendental Meditation on drug-abuse behavior.

In sum, the researchers conclude that Transcendental Meditation warrants further exploration as an alternative to drugs. Although their survey data were only suggestive, the problem of drug abuse and addiction has become epidemic among very young people, and is spreading rapidly despite the programs that have been established to counteract drug abuse. The effects of Transcendental Meditation may be desirable to many high school and college students for a variety of reasons that are, of course, not strictly physiological.

Meditation, like experience under many of the popular drugs, draws attention to the quality of being in the present tense, absorbing the mind in present experience but in a disciplined way. Busy high school students in large cities, like their busy parents, are constantly pressed to be goal directed, moving from one external project or demand to another, rather than enjoying the sentient quality of being alive. The quest for inward experience, for self-knowledge and development seems to be a direct response to a culture in which the avenues are hard to find. Young people have difficulty communicating their drug experiences and their feelings about meditation because there is no vocabulary for internal experience in our language. No matter how stringent the cultural demands for external attention and skills, and no matter how programmed the individual, the single most important issue in his life cannot be summed up by tasks accomplished, skills learned, interactions, and consumption. Any individual has the right to have, as his primary goal in life, the full mastery, expansion, and enjoy-

ment of self. Moreover, lack of self-fulfillment and total immersion in society has been implicated as a major factor in psychosomatic disease. In this sense Transcendental Meditation may provide an easy method for periodically gating out the many irrelevancies imposed by life, the demands, sensory inputs, thoughts, attitudes. In deep relaxation, a person responds less and less to sensory distractions around him, and in effect isolates himself, in what might be called sensory self-deprivation, which may account for the enhanced slow alpha rhythm and other physiological changes seen in Transcendental Meditation. Unlike all the other situations of life, which are heavily conditioned, the meditator is not submitting to any external manipulation, nor is he attempting to force his concentration. Increasingly alone, in the grand universe of his own mind, his mind becomes its own experience, naturally and without coercion. In itself, this freedom to enjoy the experience of being may be a relief from incessant conditioning in a language that is linear, and with a manner of thought that is often based on mechanical concepts of human behavior. Such relief may be sufficient to provide a kind of profound rest, and with it physiological relaxation that is unobtainable except when the mind, itself, is permitted release. The healthful and relaxing properties of Transcendental Meditation may indicate that the profoundest physiological relaxation and release from emotional arousal may require the release of the entire person, the release of the entire mind from its immersion in socially conditioned responses (for example, even our responses to heat and cold are shaped by our environment). In this sense, the already demonstrated effects of Transcendental Meditation upon the meditator's physiology, and the suggested effects upon drug takers and hypertensives, may encourage people throughout medicine to take a close look at the meaning of meditation for modern Westerners. As Hippocrates so often reiterated, it may not be possible to give therapy to a diseased part of a man unless he be treated as a whole. This holistic view of psychic and physical health is expressed in all the major Eastern philosophies that young Americans have begun to emulate.

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